



## **FINAL REPORT**

**BIODIVERSITY ASSESSMENT AND  
MONITORING IN THE PROTECTED  
AREAS/ LEBANON LEB/95/G31**

**AL\_CHOUF CEDAR NATURE RESERVE**

August 2004

**MINISTRY OF ENVIRONMENT**

**LEBANESE UNIVERSITY  
FACULTY OF SCIENCE**

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## FINAL REPORT

# **BIODIVERSITY ASSESSMENT AND MONITORING IN THE PROTECTED AREAS/ LEBANON LEB/95/G31**

## **INTRODUCTION & EXECUTIVE SUMMARY OF THE PROJECT**

The Protected Areas Project (PAP) that is financed by the Global Environment Facility (GEF) through the United Nations Development Program (UNDP) and under the execution of the Ministry of Environment (MOE) in Lebanon has an overall objective to conserve endemic and endangered wildlife and their habitats, incorporate wildlife conservation as an integral part of sustainable human development and strengthen the institutional capacity of government agencies and non-governmental organizations.

The three reserves (Al Chouf Cedar, Horsh Ehden and Palm Islands) which formed the nucleus of the PAP possessed each a management plan. Horsh Ehden and Tyre Coast are currently developing their respective plans. However, the already developed plans have used, in their planning process, two essential steps to begin with "understanding the resources (Vegetation, animals, landscapes, cultural values) and valuing the resources (What is important, what is most important)" and without which the process wouldn't be able to advance one more step. The survey and inventory work conducted by the National Council for Scientific Research (NCSR) on behalf of the Protected Areas Project provided the planners with information on the natural heritage of these sites and prepared the floor to Aammq and Tyre to launch their process too. Based on the survey and inventory, the Green Line initiated a small monitoring scheme also on behalf of the protected Areas Project in these same sites.

During the last seven years, promising efforts were made in the five sites cited above in order to reach the main objective set by the PAP: several remedial actions were stepped up and many tools of relevance to conservation were tested.

The objective will be achieved more readily if significant additional actions are implemented. More specifically the PAP is intended:

1. to highlight the importance and viability of protection in the five sites,
2. to provide a well-documented scientific database of their natural assets,
3. to establish a baseline for monitoring of key species, key habitats and progress on activities.

These will inevitably improve the implementation of the conservation measures, enhance the capacities of the research society to handle ecological and socio-economic data and identify future research needs; and promote participatory actions.

Being aware of all these positive revenues, the PAP has put, through UNDP, a "request for proposal" (RFP) to develop a biodiversity assessment and monitoring study for each of the following sites: Palm Islands Nature Reserve, Tyre Nature Reserve, Horsh Ehden Nature Reserve, Al-Chouf Cedar Nature Reserve and Aammq Wetland.

Subsequently, The UNDP engaged the Faculty of Sciences of the Lebanese University on behalf of the MOE in order to perform services in respect of Biodiversity Assessment and Monitoring in the above 5 sites, in accordance with a Professional Consulting Contract signed between UNDP/MOE and LU on 4/8/03.

On their turn, the Faculty of Sciences and its Team are aware that the development of a biodiversity assessment and monitoring study in the protected areas is a task that increases people's skills, knowledge and awareness about their natural heritage. It develops the necessary expertise to address challenges, fosters attitudes, motivations, and commitments to make informed decisions and take responsible action. Increased knowledge based on solid scientific data could be a part of an overall strategy to reach key community leaders, like teachers, school board members, elected officials, business owners, news media, etc., since it can effectively help support outreach goals, and ultimately affect change and motivate action on behalf of biocoenoses and their habitats. Preparation of maps and development of databases which inform the management teams of the protected areas on the available key species and habitats and on how, where and when to see them, appreciate them and monitor them is an effective tool of conservation. In accordance with the above mentioned contract, the Faculty of Sciences submitted to the MOE an **Inception Report** on 19/8/03 that is aiming at securing integration and providing detailed instructions for the implementation of the Project, both at the Project level, as well as at the level of each individual activity and each expert.

The objective of the Inception Report is to define:

- the methodologies, tools and techniques to be applied,
- the Terms of Reference (TORs) and work schedule for each expert of the team and,
- the Workplan and Timetable of the activities to be implemented.

On 4/11/03, the Faculty submitted to the MOE the **First Progress Report** which aimed at reflecting achievements related to the following activities:

- Revise all the previous biodiversity assessment work/research conducted within these five areas;
- Propose methodology to limit the study to a selected number of species that demonstrates the ecological interest of the site, based on the existing research work and literature;
- Identify the habitats within the sites (physical, biological and quality characteristics) with reference to the classical nomenclature (CORINE, EU Manual of Habitat Interpretation).

Following the submittal of the First Progress Report, the MOE organized a meeting between the consultant team and the local management teams that took place at the Ministry on 18/12/03. At the same day, the Faculty received the comments of the Ministry on both Inception and First Progress Reports. The mentioned comments as well as the outputs of the meeting emphasized the fact that there is a need for:

- field researches to be also conducted in the spring time so that all seasons are covered for the reasons indicated in the methodology of the inception report.
- inclusion of mega-insects such as Dragonflies, Damselflies and Butterflies, etc.
- species-species and species-habitats to be given major attention and consideration.
- more explanation of the reasoning used to select species in the filter phases.

- more information exchange between local management teams and consultant team.

Subsequently, an outcoming consensus consisted in a *sensu lato* agreement upon these raised comments.

**The Second Progress Report** which is meant to be submitted to MOE on 5/3/04 was instead submitted on 7/6/04. It is supposed to reflect achievements related to the following activities:

- i. Report on the chronology of the selected number of species if literature exists;
- ii. Conduct field assessment within the sites to verify the different status of the selected number of species and document sightings through sampling, photography and/ or other approved scientific procedures;
- iii. Rank the species in terms of priority (Rare, Endemic, Noteworthy, Most Threatened and Invasive species);
- iv. Relate these species to the corresponding habitats;
- v. Identify specific distribution: spatial (zonation/ location) and temporal (seasonal/ activity);
- vi. Identify status of the community: densities/ abundance/ dominance/ dynamics;
- vii. Identify nature and importance of threats on these species;
- viii. Provide detailed information for the selected key species and communities.

**This Final Report** includes the final outputs of the previous activities, and reflects achievements related to the following activities:

- Based on findings, include the cover in %, the height of layers and the dominant species in each layer with habitat description;
- Determine changing dynamics and the level of sensitivity of the habitats based on findings, field research and literature (natural evolution processes – nature and importance of threats dysfunctions – major human-induced deteriorations);
- Analyze the nature of major gradients, identification of the main mechanisms (soil/vegetation-exploitation relationships, habitat/biocenosis-exploitation relationship, fertility, salinity, erosion capacity, various impacts);
- Develop recommendations for urgent conservation actions and sustainable management practices specific to each site;
- Develop appropriate mitigation measure for the identified impacts on the entire ecosystem;
- Propose site-specific strategies and indicators for monitoring, taking into account previous work conducted (GreenLine, MedWet Coast...);
- Conduct at least two consultation workshops with concerned stakeholders to discuss findings;
- Identify further research profiles based on fieldwork and findings.

## A. AL-CHOUF CEDAR NATURE RESERVE



## **A.1 GENERAL PRESENTATION OF THE SITE**

### **A.1.1 Location**

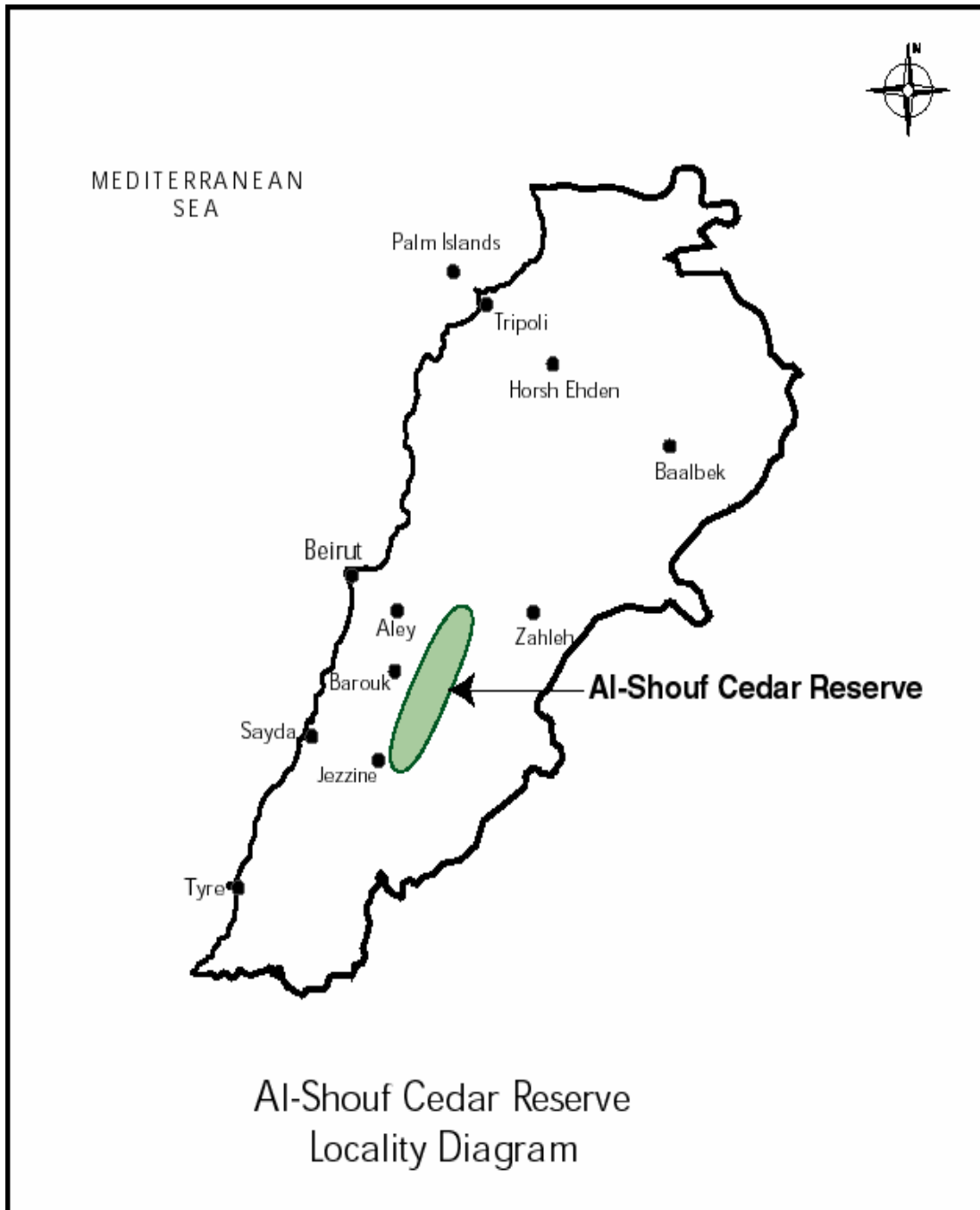
The Al-Chouf Cedar Nature Reserve lies between longitude 35° 28' - 35° 47' East and Latitude 33° 32' - 35° 48' North at c.1200-1980 m of altitudes. It is located along a mountain range known as the Barouk Mountain, which is a southern extension of the Mount Lebanon Range (Figure 1). The range runs parallel to the Mediterranean coast. The Beirut-Damascus highway and the town of Jezzine define the north and south borders of the reserve. The western slopes of the range face the Chouf region; the eastern slopes face Mount Hermon and form the western escarpment of the Beqaa Valley. The reserve covers an area of c.165 km<sup>2</sup>.

### **A.1.2 Legal status**

Government legislation, Law No. 532 of 24 July 1996 declared “The communal lands of Niha, Jbeih, Mreste, Khraibe, Maasser, Barouk, Bmohreh, Ain Dara, Ain Zahalta villages, in addition to the Government owned lands on the eastern side of Barouk Mountain, a Nature Reserve.”

### **A.1.3 Description**

The Al-Chouf Cedar Nature Reserve reaches from Dahr al Baidar in the North to Niha Mountain near Jezzine in the South. The Eastern slopes, blanketed with oak forest, offer a breathtaking view of the Beqaa plain. But the biggest attraction are the three separate cedar forests of Maasir Chouf, Barouk and Ain Zhalta / Bmohray situated on the upper elevations of the western slopes of the Mount Lebanon chain. The Niha Mountain, with only scattered patches of trees, represents the natural southern limit of Lebanese Cedar (*Cedrus libani*). Above the town of Barouk, terraces of cedars were planted in the 60's in a massive effort of reforestation. The genetic origins of those plantings have been questioned and are subject to ongoing research. As a product of past landuse and patterns that misused the environment, including recent warfare, the landscape of Al-Chouf Cedar Reserve is extensively degraded. The cedar forest remnants are largely confined to the steeper and less accessible areas, particularly towards the higher altitude of the cedar range where trees tend to be wider spaced and less attractive for timber harvesting. Many of the oak forests have been subject to regular harvesting for firewood and charcoal production, resulting in extensive areas of coppiced oak woodland and low forest. Today, without human interference and costly machinery, the cedar forest, protected from grazing herbs, shows clear signs of natural regeneration. Still, only about 5% of the Reserve is forested with Cedars, with shrub vegetation covering most of the remaining areas.



**Figure 1:** Location of Al-Chouf Cedar Nature Reserve

#### **A.1.4 Abiotic characteristics**

### **A.1.4.1 Physiographic characteristics**

#### **A.1.4.1.1 Geology**

The Barouk Mountain comprises rocks from the third geological era (Pliocene) which has undergone major tectonic movement that divided Mount Lebanon into 2 parallel parts; the eastern range is called the Anti-Lebanon, and the western range is called Mount Lebanon. The two mountain ranges are separated by the Beqaa Valley, which is composed of recent infill sediments. The main rocks are limestone. The whole of the Barouk Mountain is cavernous limestone, with many surface features such as dolines indicating the underlying cavernous form of the mountain range. One particularly noteworthy cave, estimated to be 700 meters long, is located near Niha village. Villagers report an abundance of stalactites and stalagmites and that there is an underground body of water.

#### **A.1.4.1.2 Geomorphology**

Further south from Dahr El Baidar is the highest peak on the range at 1980 meters. The trend from north to south is for the eastern slopes to change from very steep to less steep and for the western slopes to become increasingly steep. The top of the Barouk range becomes increasingly narrow towards the south.

#### **A.1.4.1.3 Hydrology**

Precipitation in the watershed is the source of both surface streamflow and groundwater. The major portion of this occurs as rain. Snowfall often occurs at the upper elevations but snow seldom persists more than a few days and disappears before the end of the rainy season.

Normally snow has little overall direct effect on stream-flow within the watershed. However, on rare occasions warm rains falling on the snow-pack may result in rapid melting and release of large quantities of water at a time when the soils are already fully saturated. These conditions result in rapid runoff and floods.

A large proportion of the exposed surface rock in the Barouk region is cavernous, fissured and broken limestone, and its porous condition makes it very permeable. This results in much of the precipitation infiltrating with minimum surface runoff despite the often-shallow soils and sparse vegetative cover. Water percolates downward through the various formations and feeds the many large springs found on lower slopes in the area. Such springs help maintain stream-flow during the April to November dry season. Surface water flows originating on the range are mostly seasonal but some are perennial.

Underground water generates outflow rivers such as:

- Al Awali River, more commonly known as Al-Barouk river
- Damour River, known as Al-Safa river

The summit of the range is considered as a divide between two hydrological systems because of the difference between the two slopes of the mountain. The eastern slope is much steeper and favors surface stream flows, whereas the western slope is less steep and favors ground water aquifers.

The rivers that flow in the valleys are the major source of agriculture irrigation and supply a dozen Shouf villages with domestic water and some of the western Bekaa villages. It is also the main source of water for the Aammiq Swamp in the Bekaa.

#### **A.1.4.1.4 Pedology**

Physical characteristics of the soils are:

- Homogenous, belonging to the red brown Mediterranean soils formed on hard marl limestone.
- derived from Jurassic, Balthonian, Callovian to Oxfordien – Portlandian marl limestone
- Stone contents ranges from 80 – 90 %

From an erosion point of view these soils are in a state of equilibrium due to:

- High permeability
- Mask of calcareous fragments
- Good vegetative cover
- Good drainage

#### **A.1.4.1.5 Climatology**

The annual rainfall average is 1200 mm, and the mean annual temperature is 11.3° C. The mean daily maximum temperature is 23.4° C in August whereas the mean minimum temperature in January is -0.6° C. The absolute temperature ranges from -10.8° C in January to 32.3° in August. The mean relative humidity lies around 65% but the eastern slopes are slightly dryer. There are about 50 to 55 days of snow fall per year (Service Meteo/ Ministry of Public Work and Transport).

### **A.1.5 Biotic characteristics**

#### **A.1.5.1 FLORA**

The flora of the Al-Chouf Cedar area is partly covered by Mouterde's 1966, 1970 and 1983 flora of Lebanon. The most recent and extensive botanical researches on this site were conducted, on behalf of the Ministry of Environment (Protected Areas Project), by (Georges Tohmé) the National Council for Scientific Research (NCSR) in 1999. Since then extremely few flora reports on this site were published or known (see Sattout and Talhouk, 2001). Tohmé continued his field botanical studies at Al-Chouf Cedar Reserve during the last three years in order to obtain confirmation on the status of certain species. His recent new findings are published in Tohmé, G. & Tohmé, H. (2002). The list of Al-Chouf Cedar Reserve species (Table 1= Annex I) includes 436 identified species distributed over 61 families. Also it shows that the reserve is habitat to 25 internationally and nationally threatened species, 48 endemic to Lebanon or Lebanon and Syria or Lebanon and Turkey, and 14 rare species, whilst 214 species are restricted to the Eastern Mediterranean or Middle East area.

##### **A.1.5.1.1 The floristic species**

#### A.1.5.1.1.1 Selected species

The selected plants through the fine filter belong to 14 species: 1) *Cedrus libani* which is the symbol of Lebanon and the main significant component of the reserve, 2) *Quercus brantii* look for its forest cover which characterizes the site, 3) *Arrhenatherum elatius* and *Melica inaequiglumis* because they are rare and localized in the reserve where they have suffered in the near past from grazing, 4) *Helichrysum pallasii* due to its status as threatened in the past and not very common at all heights of the reserve, 5) *Tulipa montana* and *Phytolacca pruinosa* for their ornamental and economic values and for the fact they are found in very limited numbers within the reserve. They could be increased by bringing some *Tulipa montana* from Jabal Turbol and *Phytolacca pruinosa* from Wadi Ibrissa above Hermel, 6) *Cephalaria cedrorum* because of its endemism to Al-Chouf Cedar only, 7) *Gundelia tournefortii* as locally threatened because it is heavily collected and uprooted by people and for its consuming value, high demand and high price, 8) *Origanum ehrenbergii* and *Origanum syriacum* as well as *Rhus coriara* which are considered multipurpose species and consequently widely harvested by people, and 9) *Geum urbanum* and *Micromeria myrtifolia* for being highly recommended medicinal species. The new findings of the surveys as well as the information obtained from stakeholders, mainly local management teams of protected sites incurred, in most cases, slight improvement of the selected species list whilst the field studies, especially in the spring season lead to a better fine-tuning of it.

Under abundance:

- 5 : indicate that more than 3/4 of the habitat is covered by the species.
- 4 : indicate that between 1/2 and 3/4 of the habitat is covered by the species.
- 3 : indicate that between 1/2 and 1/4 of the habitat is covered by the species.
- 2 : indicate that 1/20 of the habitat is covered by the species.
- 1 : weak cover.
- + : very weak cover.
- 0 : selected from literature according to the selection criteria but not found during the field surveys.

#### A.1.5.1.1.1 Rare (4)

Species	English Name	Local Name	Localization		Abundance
			Habitat	GPS	
<i>Melica inaequiglumis</i>	<b>Unequal-glumed melick</b>	Meliqa	Grazing and dry places,	N 33° 40' 533'' E 35° 41' 942''	(1) Scarce
<i>Helichrysum pallasii</i>	<b>Pallas' everlasting</b>	Khalida	Treeless, stony areas	N 33° 40' 870'' E 35° 41' 876''	(1) Scarce
<i>Tulipa montana</i>	<b>Mountain tulip</b>	Toulib	Grazing-ground	N 33° 40' 491'' E 35° 41' 837''	(+) Rare
<i>Phytolacca pruinosa</i>	<b>Frosty pokeweed</b>	El-Lakk	Woodland s, road	N 33° 40' 220'' E 35° 40' 811''	(+) Rare

			sides		
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#### A.1.5.1.1.2 Endemic (4)

Species	English Name	Local Name	Endemism	Localization		Abundance
				Habitat	GPS	
<i>Cedrus libani</i>	<b>Cedar of Lebanon</b>	Arz	Lebanon, Syria, Turkey	Forest, high mountains	Between N 33° 41' 234'' E 35° 41' 870'' and N 33° 40' 549'' E 35° 41' 560''	Common
<i>Cephalaria cedrorum</i>	<b>Cedar scabious</b>	Siwan el Arz	Arz el Chouf Reserve	Forest, high mountains	Between N 33° 41' 234'' E 35° 41' 870'' and N 33° 40' 549'' E 35° 41' 560''	Common
<i>Origanum ehrenbergii</i>	<b>Ehrenberg marjoram</b>	Zaatar snawbar	Lebanon	Sandstones	N 33° 42' 157'' E 35° 42' 006''	Localized
<i>Origanum syriacum</i>	<b>Syrian origanum</b>	Zaatar	To Middle East	Various habitats	N 33° 40' 220'' E 35° 40' 811''	Common

#### A.1.5.1.1.3 Noteworthy (9)

Species	English Name	Local Name	Value	Localization		Abundance
				Habitat	GPS	
<i>Cedrus libani</i>	<b>Cedar of Lebanon</b>	Arz	Flagship, National tree	Forest, high mountains	Between N 33° 41' 234'' E 35° 41' 870'' and N 33° 40' 549'' E 35° 41' 560''	(5)Common
<i>Helichrysum pallasii</i>	<b>Pallas' everlasting</b>	Khalida	Ornamental	Treeless, stony areas	N 33° 40' 870'' E 35° 41' 876''	(1)Scarce
<i>Tulipa montana</i>	<b>Mountain tulip</b>	Toulib	Ornamental	Grazing-ground	N 33° 40' 491'' E 35° 41' 837''	(+)Rare
<i>Gundelia tournefortii</i>	<b>Tournefort's gundelia</b>	Akkoub	Economic	Grazing-ground	N 33° 41' 846'' E 35° 42' 133''	(2)Localized
<i>Origanum ehrenbergii</i>	<b>Ehrenberg marjoram</b>	Zaatar snawbar	Economic	Sandstones	N 33° 42' 157'' E 35° 42' 006''	(2)Localized
<i>Origanum syriacum</i>	<b>Syrian origanum</b>	Zaatar	Economic Medicinal	Various habitats	N 33° 40' 220'' E 35° 40' 811''	(3)Common
<i>Rhus coriara</i>	<b>Tanner's sumach</b>	Summaq	Economic Medicinal	Waste grounds	N 33° 40' 220'' E 35° 40' 811''	(2)Localized
<i>Geum urbanum</i>	<b>Herb-bennet</b>	Geum	Economic Medicinal	Under trees	N 33° 40' 549'' E 35° 41' 560''	(1,5)Localize d
<i>Micromeria myrtifolia</i>	<b>Greek savory</b>	Zoufa	Medicinal	Stony places	N 33° 40' 20'' E 35° 40' 811''	(2)Localized

**A.1.5.1.1.4 Introduced (Alien invasive) (0)**

Species	English Name	Local Name	Origin	Localization		Abundance
				Habitat	GPS	

**1.5.1.1.5 Threatened (3)**


Species	English Name	Local Name	Level of threat	Localization		Abundance
				Habitat	GPS	
<i>Origanum ehrenbergii</i>	<b>Ehrenberg marjoram</b>	Zaatar snawbar	Global	Sandstones	N 33° 42'157'' E 35° 42' 006''	Localized
<i>Origanum syriacum</i>	<b>Syrian origanum</b>	Zaatar	Regional	Various habitats	N 33° 40'220'' E 35° 40' 811''	Common
<i>Helichrysum pallasii</i>	<b>Pallas'everlasting</b>	Khalida	National	Treeless area	N 33° 40' 870'' E 35° 41' 876''	Scarce

**A.1.5.1.1.6 Specific distribution: spatial (zonation/ location) and temporal (seasonal/ activity) of selected species**

R = rare; S = scarce; U = uncommon or localized; C = common; Fl = flowering period (3-5 = March-May); A = annual; V = Perennial (vivace); T = tree or sub-tree; H = herb.


Species	R	S	U	C	Fl	A	V	T	H
<i>Cedrus libani</i>				+	6-9		+	+	
<i>Quercus brantii look</i>			+		4-5		+	+	
<i>Arrhenatherum elatius</i>			+		5-7		+		+
<i>Melica inaequiglumis</i>		+			4-7		+		+
<i>Helichrysum pallasii</i>		+			7-8	+			+
<i>Tulipa montana</i>	+				3-5		+		+
<i>Phytolacca pruinosa</i>	+				6-9		+	+	
<i>Cephalaria cedrorum</i>				+	6-10		+		+
<i>Gundelia tournefortii</i>			+		4-5	+			+
<i>Origanum ehrenbergii</i>			+		6-10	+			+
<i>Origanum syriacum</i>				+	6-12	+			+
<i>Rhus coriara</i>			+		4-6		+	+	
<i>Geum urbanum</i>			+		5-8		+		+
<i>Micromeria myrtifolia</i>			+		4-9		+		+

## A.1.5.1.1.7 Useful information about the selected species

Genus, Latin	<i>Cedrus</i>
Species, Latin	<i>libani</i>
Author	Rich.
	
Family	PINACEAE
Common name, English	Cedar of Lebanon
Common name, Arabic	Arz lubnane
Chorotype	Lebanon, Syria and Turkey
Life form Raunkiaer	Perennial phanerophyte
Summer shedding	Tree 40 m high
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to	Calcareous aerated soil, 1200-1900 m above sea level with oak




Vegetation formation	trees, pine, fir in mixed forests.
Synanthropy	It can regenerate naturally but Lebanese citizens and their friends' plant it now where the climate is suitable for it.
Status	It is preserved by law in Natural Reserves
Chronology	The Cedar of Lebanon is cited numerous times in history, religion and mythology. In addition to its significant role in the Epic of Gilgamesh, the Cedar of Lebanon is regarded as a world tree in several mythological passages.
Usage	<i>Medicinally, the Cedar of Lebanon also made its mark. The pitch of the cedar was utilized for easing the pain of toothaches. The sawdust of the cedar puts snakes to flight, and thus makes sleeping under the shade of a cedar a relatively safe siesta. Furthermore, based upon historical analyses, it is believed that the cedar was used in the preservation of the corpses in Egypt. It was also highly prized as incense.</i>
Identification	Solitary cones 7-10 x 4-7 cm, purple-violet than gray-greenish

Genus, Latin	Cephalaria
Species, Latin	<i>cedrorum</i>
Author	Mouterde
	
	Photo: Georges Tohmé
Family	DIPSACACEAE
Common name, English	Cedar scabious
Common name, Arabic	Siwan al-arz
Chorotype	Endemic to cedars area in Jabal Barouk
Life form Raunkiaer	Perennial chamephyte
Summer shedding	Flowering all summer
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or	In association with cedars trees

affinity to Vegetation formation	
Synanthropy	Grows only in natural habitat
Status	Abundant
Chronology	Thiebot described it as <i>Cephalaria pilosa</i> between 1928 and 1934. Mouterde gave it its actual name in 1983. It was reported from Arz el Barouk and Arz Ain Zhalta by Thiebot, Gombault, Mouterde and Pabot. At Maasser, it was reported prior to 1953 by Pabot only. In 1999, it was found by Tohmé in the reserve but in the summer 2003 he found this endemic species to Al Chouf Cedar Reserve at the Maasser in good condition.
Identification	Corolla purple-lilac

Genus, Latin	<i>Geum</i>

Species, Latin	<i>urbanum</i>
Author	L.
	
	Photo: Georges Tohmé
Family	ROSACEAE
Common name, English	Herb-bennet
Common name, Arabic	Geum
Chorotype	Europe, North Africa, Western Asia, Himalayas, Siberia
Life form Raunkiaer	Perennial chamaephyte
Summer shedding	Flowering time May to early September in Ehden forest
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	Grassy lands in supra and Montane-Mediterranean levels
Synanthropy	Grows only in natural habitats
Status	Not very abundant it is collected for medicinal use
Chronology	First reported from Al-Chouf Cedar by Blanche (1883). Also found at the same place by Georges and Henriette Tohmé (2002).
Usage	<i>Used to treat digestive malfunctions and bronchitis and as mouth antiseptic.</i>
Identification	Yellow petals, erect stem 20-50 cm long


Genus, Latin	Gundelia

Species, Latin	<i>tournefortii</i>
Author	L.
	
	Photo: Georges Tohmé
Family	ASTERACEAE
Common name, English	Tournefort's gundelia
Common name, Arabic	Akkoub
Chorotype	East Mediterranean Region
Life form	Perennial chamaephyte

Raunkiaer	
Summer shedding	Flowering period April-May
Succulence	Succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	Not in cultivated fields, from coastal to desert areas. Not in very high mountains
Synanthropy	Grows only in Natural habitats
Status	Threatened because edible
Chronology	Known since ages as appreciated edible plant in Lebanon but never reported from this particular reserve till it was found by G. & H. Tohmé in 1998 ( <i>pers. obs.</i> ) as abundant species above the Barouk.
Usage	<i>Used since ages as distinguished food in all parts of Lebanon and Syria. Its buds are cooked in a special way and its prices are high. In addition, it may be preserved under pressure in hermetically closed jars. It can be wisely invested if properly managed and cultivated.</i>
Identification	Very spiny plant corolla yellow

Genus, Latin	Helichrysum




Species, Latin	<i>pallasii</i>
Author	(Sprengel) Ledeb.
	
	Photo: Georges Tohmé
Family	ASTERACEAE
Common name, English	Pallas' everlasting
Common name, Arabic	Khalidat Pallas
Chorotype	East Mediterranean Region
Life form Raunkiaer	Perennial chamephyte
Summer shedding	Flowering period summer
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	Rocky slopes up to 2600 m
Synanthropy	Grows only in natural habitats.
Status	Protected now in Natural Reserve against over collecting
Chronology	Mouterde (1983) mentioned it from the Cedars of Ain-Zhalta and from the Cedars of Barouk. Prior to 1934, René Gombault collected it also from the Cedars of Barouk.
Usage	<i>Sold by villagers on the sides of the roads due to its beautiful golden color.</i>


	<i>This is maintained after pluck. The Globe everlasting showed obvious degradation in the near past due to excessive plucking by flower collectors.</i>
Identification	Involucres bright yellow

Genus, Latin	Micromeria
Species, Latin	<i>myrtifolia</i>
Author	Boiss. & Hohen.




	
	Photo: Georges Tohmé
Family	LAMIACEAE
Common name, English	Greek savory
Common name, Arabic	Zoufa,
Chorotype	From Crete to Kurdistan
Life form Raunkiaer	Geophyte
Summer shedding	Flowering period: April-September
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	Stony areas from seashores to Anti-Lebanon
Synanthropy	Grows in natural habitats
Status	Abundant
Chronology	First recorded between Barouk and Maasser by Pabot in 1952. Mouterde (1983) mentioned it as a cited species by Pabot.
Usage	<i>Used as infusion to reduce chest diseases.</i>
Identification	Flowers pink in verticilles

Genus, Latin	Origanum
Species,	

Latin	
Author	Boiss.
	
	Photo: Georges Tohmé
Family	LAMIACEAE
Common name, English	Ehrenberg marjoram
Common name, Arabic	Zaatar as-sanawbar
Chorotype	Endemic to Lebanon
Life form Raunkiaer	Perennial chamephyte
Summer shedding	Flowering period June-October


Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	Sandstone in association with Pine wood
Synanthropy	Grows only in natural habitats
Status	It is collected because edible
Chronology	It lives under pine groves on sandy soil. Like the Syrian origanum, it is used in making the Manakish (Thym Pizza). It was reported by Post from Ain Zhalta in 1890, Frère Louis from Jabal Barouk in 1932 and by Mouterde (1983) from Ain Zhalta. Endemic to Lebanon but common and deserves protection.
Identification	Inflorescence in many levels from the 2/3 of the stem until top

Genus, Latin	<i>Origanum</i>
Species, Latin	
Author	L.


	
	Photo: Georges Tohmé
Family	LAMIACEAE
Common name, English	Syrian origanum
Common name, Arabic	Zaatar soury
Chorotype	East Mediterranean Region
Life form Raunkiaer	Perennial sub-frutescent plant
Summer shedding	Evergreen
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	All soils, especially rocky and old walls
Synanthropy	Grows in natural habitats. Planted in gardens
Status	Very common but threatened because it is edible
Chronology	Widespread over all Lebanon, mainly on calcareous soil. First reported from Al-Chouf Cedar by Blanche (1880).
Usage	<i>Medicinal and consumable plant of high economic value. Heavily harvested by locals.</i>
Identification	Aromatic plant with white flowers

Genus, Latin	<b>Phytolacca</b>
Species, Latin	<i>pruinosa</i>
Author	Fenzl.



		
	Photo: Georges Tohmé	
Family	PHYTOLACCACEAE	
Common name, English	Frosty pokeweed	
Common name, Arabic	Lakkyah hababyah	
Chorotype	East Mediterranean Region	
Life form Raunkiaer	Phanerophyte	
Summer shedding	Flowering period in summer	
Succulence	Non-succulent	
Salt resistance	Glycophyte	
Habitat or affinity to Vegetation formation	Woodlands on rocky areas	
Synanthropy	Grows on natural habitats	
Status	It becomes rare	
Chronology	Reported from above Maasser by Mouterde (1966), Pabot and Fattal (undated). Recorded at the same site by G. & H. Tohmé in the summer 2002. Rare and in progress deterioration near the road of the reserve.	
Usage	Fruits were used in cabinet-making.	
Identification	Dioecious over than 1 m high	


Genus, Latin	Quercus
Species, Latin	<i>brantii look</i>
Author	Mouterde

	
	Photo: Georges Tohmé
Family	FAGACEAE
Common name, English	Brant's oak
Common name, Arabic	Ballout Brant
Chorotype	Iran, Iraq, Turkey and Lebanon
Life form Raunkiaer	Caduceus phanerophyte
Summer shedding	Leaves April to October
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	Calcareous soil in association with Cedars tree
Synanthropy	Grows in natural habitats. It may be used in reforestation projects
Status	It is protected now inside Natural Reserve

Chronology	Similar to the <i>Quercus libani</i> (which is not found in Lebanon) of Syria, Turkey, Iraq and Iran, it was found first in the Anti-Lebanon by Kotschy in 1856 and found later in Ain-Zhalta, Barouk and Maasser by Mouterde (1966) and studied by him. Pabot mentioned it also at the same time.
Usage	
Identification	Cup covering half of the globular corm


Genus, Latin	Rhus
Species, Latin	
Author	L.



	 <p data-bbox="576 1238 1230 1279">Photo: Georges Tohmé</p>
Family	ANACARDIACEAE
Common name, English	Tanner's sumach
Common name, Arabic	Soummaq
Chorotype	South Europe and western Asia
Life form Raunkiaer	Phanerophyte
Summer shedding	Flowering and fructification time from April to October
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	Waste grounds dry slopes near cultivated fields
Synanthropy	Grows in natural habitats. Planted in gardens
Status	Abundant
Chronology	Mentioned first by Post in 1890 from Jabal Barouk and by Mouterde from Ain Zhalta where it was also seen by Tohmé

	in 1998.
Usage	Medicinal and edible plant of significant economic value
Identification	Leaves alternate flowers yellow-pale

Genus, Latin	Tulipa
Species, Latin	<i>montana</i>
Author	Lindley

	 <p data-bbox="576 925 1104 965">Photo: Georges Tohmé</p>
Family	LILIACEAE
Common name, English	Mountain tulip
Common name, Arabic	Tulip jabaly
Chorotype	East Mediterranean Region
Life form Raunkiaer	Geophyte
Summer shedding	Ephemeral
Succulence	Non-succulent
Salt resistance	Glycophyte
Habitat or affinity to Vegetation formation	Woodlands, grazing-grounds
Synanthropy	Grows in natural habitats
Status	It becomes rare because of collecting
Chronology	Cited by Mouterde and Pabot in 1952 near the cedars, above Maasser. Reported and recorded by G. & H. Tohmé (2002) at the same place and above Barouk in 1999 ( <i>pers. obs.</i> ). Very rare with recent degradation. Found in Jabal Turbol by G. & H Tohmé in April 2004 ( <i>pers. obs.</i> ).
Usage	<i>Ornamental plant.</i>
Identification	Glaucous leaves red purple big flowers

**A.1.5.1.2 The vegetal communities**

This site is about 1200-1980 meters above sea level. It is bordered from the side of Ain Zhalta and Barouk by stands of pine groves on sandy substrates. According to Corine Classification (1999), the reserve belongs to three Mediterranean levels: 1) the "Supra-Mediterranean Level" of vegetation which extends over the lower parts of the eastern and

western slopes up to 1500 meters of altitude, with oak trees as dominant species, but on the western slopes the cedar trees usually dominate between 1050 and 1925 meters; 2) the "Montane Mediterranean Level" that covers both slopes between 1500 and 1900 meters with cedar dominant trees on the western slopes and absence of cedar trees on the eastern slopes where the oak and azarole trees take place; and 3) the "Oro-Mediterranean level" of vegetation which extends above 1900 meters.

#### **A.1.5.1.2.1 Characteristics**

**A.1.5.1.2.1.1 Physical:** the substratum and the rocks of the reserve are almost made of limestone. Few areas, especially around Bmohrei, Ain Zhalta and Barouk are of sandy nature. The water is rare and appears in form of a source at Ain El Lujeh on the eastern slope whereas it is in form of a man-made water rain pool on the western slope. The latter is more humid than the eastern slope, especially in summer time. The open areas are rocky and dry whilst the soil of the forest areas is rich in organic materials.

**A.1.5.1.2.1.2 Biotic:** wilderness areas that are made of a variety of ecosystem as a result of quasi-absence of human activities and different bioclimatic conditions over a large area characterize the Al-Chouf Cedar site. Several micro-habitats such as those created by the shade of trees and rocks or provided by glades within the forests or woods add to the diversity of the reserve.

**A.1.5.1.2.1.3 Quality:** the initiative to declare Al-Chouf Cedar area a reserve in late nineties constituted the first step towards effective conservation and protection of natural resources. In fact the many oriented activities that are implemented to stop tree cutting, grazing and hunting within the reserve are currently reflected by an improved ecological balance. Because of all these reasons beside the guided and controlled tours, the negative impact of human may be classified as very weak to weak.

**A.1.5.1.2.1.4 Habitats & Vegetal formations:** Under the three "Corine" levels of vegetation that are mentioned above, the Al-Chouf Cedar Reserve encompasses one vegetation formation type (Endemic oro-Mediterranean heaths with gorse) that is represented by the above tree-line area, mainly at the transition zone between the "Montane" and "Oro" Mediterranean Levels. Thus, the cedar forests of the western slopes and the oak woods of the eastern slopes are not considered in Corine classification which deals with Mediterranean habitats of European countries from Spain in the west up to Greece in the east. Accordingly, the habitat types (2, 3 & 4) below will be described by the author of this section as new to Corine classification.

- 1- **"Endemic oro-Mediterranean heaths with gorse"** type (code 4090) of the category "Temperate Heath and Scrub" of the oro-mediterranean vegetation level. This type is made from primary cushion heaths of the high, dry mountains of the Mediterranean and Irano-Turanian regions, with low, cushion-forming, often spiny shrubs, such as *Acantholimon*, *Astragalus*, *Bupleurum*, etc. In Corine classification, which doesn't incorporate the east Mediterranean corner, there are 15 sub-types with a variety of plant associations where each is specific to an area such as

Crete, Italy (Etna, Madonie, Apennine), Greece (Hellenic, Helleno-Balkan), France, etc. This is normal because of the endemism with which the sub-types deal with. Therefore it is logic to give a local name to the sub-type found at Al-Chouf Cedar Reserve such as "Barouk heaths sub-type" that could be considered as a formation with *Acantholimon libanoticum*, *Astragalus cruentiflorus*, *Astragalus gummifer*, *Berberis libanotica*, *Dianthus libanotis*, *Prunus prostrata*, *Rosa glutinosa*, *Taraxacum syriacum*. Of the main species which join this formation there are: *Acantholimon libanoticum*, *Alyssum baumgartnerianum*, *Alyssum condensatum*, *Alyssum mouradicum*, *Alyssum repens*, *Asperula glareosa*, *Astragalus cruentiflorus*, *Astragalus gummifer*, *Berberis libanotica*, *Dianthus karami*, *Dianthus libanotis*, *Dianthus strictus multipunctatus*, *Dianthus strictus subnervis*, *Filago anatolica*, *Galium incanum*, *Gallium verticillatum*, *Helichrysum pallasii*, *Kitaibelia balansae*, *Prunus prostrata*, *Rosa glutinosa*, *Teucrium polium* and *Taraxacum syriacum*.

- 2- ***Cedrus libani* forests** of the "Supra and Montane-Mediterranean Levels" (western slopes) with association of *Acer tauricum*, *Astragalus emarginatus*, *Cephalaria cedrorum*, *Cicerbita mulgedioides*, *Geranium libani*, *Lathyrus libani*, *Lonicera nummulariifolia*, *Quercus brandtii* look, *Rubia aucheri*, *Sorbus flabellifolia*, *Tanacetum cilicicum* and *Vinca libanotica*. Other plant species mainly found in this formation include mainly: *Acer tauricum*, *Alyssum murale*, *Alyssum stribrnyi*, *Anemone blanda*, *Arabis caucasica*, *Astragalus echinus*, *Astragalus emarginatus*, *Asyneuma rigidum*, *Berberis libanotica*, *Campanula cymbalaria*, *Cedrus libani*, *Cephalaria cedrorum*, *Cephalorrhynchus tuberosus*, *Cicerbita mulgedioides*, *Ficaria ficaroides*, *Galium incanum*, *Galium libanoticum*, *Galium verum*, *Geranium libani*, *Geum urbanum*, *Lamium striatum*, *Lathyrus libani*, *Lonicera etrusca*, *Lonicera nummulariifolia*, *Nepeta cilicica*, *Peltaria angustifolia*, *Phlomis brevilabris*, *Phlomis rigida*, *Quercus brantii* look, *Rubia aucheri*, *Salvia microstegia*, *Sambucus ebulus*, *Scutellaria orientalis alpina*, *Scutellaria tomentosa*, *Senecio doriformis doriformis*, *Sideretis libanotica*, *Sorbus flabellifolia*, *Tanacetum cilicicum*, *Thlaspi brevicaule*, *Thlaspi microstylum*, *Valerianella echinata*, *Veronica polifolia* and *Vinca libanotica*.
- 3- ***Quercus infectoria latifolia* and *Quercus calliprinos* woods** of the "Supra and Montane-Mediterranean Levels" (western slopes) with the association of: *Acer tauricum*, *Arceuthos drupacea*, *Astragalus pinetorum*, *Centranthus longiflorus latifolius*, *Juniperus oxycedrus*, *Marrubium radiatum*, *Quercus calliprinos*, *Quercus infectoria latifolia*, *Spartium junceum*. Other plant species found in this formation include mainly: *Acer tauricum*, *Achillea kotschyi*, *Ajuga tridactylites palaestina*, *Alcea digitata*, *Allium ampeloprasum leucanthum*, *Amygdalus korschinsky*, *Anchonium billardieri*,

*Androsace maxima*, *Anthemis tinctoria discoidea*, *Arabis aucheri*, *Arceuthos drupacea*, *Aristolochia altissima*, *Aristolochia poecilantha*, *Aristolochia scabridula*, *Asperula arvensis*, *Asperula breviflora*, *Asperula libanotica*, *Astragalus coluteoides*, *Astragalus pinetorum*, *Astragalus zachlensis*, *Calamintha rotundifolia*, *Campanula stricta libanotica*, *Centaurea triumfetti*, *Centranthus longiflorus latifolius*, *Colutea cilicica*, *Cruciata coronata*, *Cyclamen coum*, *Daphne oleoides*, *Fibigia eriocarpa*, *Galium peplidifolium*, *Geranium libani*, *Geranium libanoticum*, *Hesperia pendula*, *Hyoscyamus reticulatus*, *Juniperus oxycedrus*, *Lapsana communis ramosissima*, *Legousia pentagonia*, *Lotus gebelia libanotica*, *Marrubium radiatum*, *Micromeria myrtifolia*, *Morina persica*, *Nepeta italica*, *Phlomis chrysophylla*, *Pirus syriaca*, *Prunus microcarpa*, *Prunus ursina*, *Rhus coriaria*, *Rosa canina*, *Rosularia libanotica*, *Rubia aucheri*, *Salvia tomentosa*, *Scutellaria utriculata*, *Siebera pungens*, *Sorbus flabellifolia*, *Sorbus torminalis*, *Spartium junceum*, *Styrax officinalis*, *Tanacetum aucheri*, *Tragopogon bupthalmoides*, *Valerianella dactylophylla*, *Verbascum cedreti*, *Verbascum leptostachyum*, *Ziziphora canescens*.

- a. **Quercus infectoria latifolia and Quercus calliprinos dry woods** of the "Supra and Montane-Mediterranean Levels"(eastern slopes) with *Astragalus gummifer*, *Centranthus longiflorus latifolius*, *Juniperus oxycedrus*, *Prunus korschinskyi*, *Sorbus flabellifolia*, *Ziziphora capitata*. Other plant species found in this formation include: *Arceuthos drupacea*, *Colchicum brachyphyllum*, *Crataegus azarolus*, *Crataegus monogyna*, *Galium verticillatum*, *Glaucium leiocarpum*, *Potentilla geranioides syriaca*, *Salvia multicaulis*.

#### A.1.5.1.2.1.4.1 Cover and stratification

The table below gives several parameters delimiting the identity of the four communities:

R = rare; S = scarce; U = uncommon or localized; C = common; Fl = flowering period (3-5 = March-May); A = annual; V = Perennial (vivace); T = tree or sub-tree; H = herb; A-D = abundance-dominance.

	Species	R	S	U	C	Fl	A	V	T	H	A-D	Tall ligneous> 2m	Shrub<2 m	Herbaceous	Cover
Oak	<i>Quercus calliprinos</i>					6-9		+	+		3,8	±20m			45
	<i>Allium ampeloprasum leucanthum</i>										3,7			Up to 150cm	40
Tree	<i>Quercus infectoria latifolia</i>					3-4		+	+		2,2	10m			8
	<i>Prunus ursina</i>										2	4-8m			5
W-slopes	<i>Acer tauricum</i>				+	3-5		+	+		2	5-6m			5
	<i>Centranthus longiflorus latifolius</i>					6-10	+		+		2			60-150cm	5
	<i>Juniperus oxycedrus</i>				+	3-6		+	+		2	Up to 10m			5
	<i>Spartium junceum</i>					4-6		+	+		2		1-4m		5
	<i>Marrubium radiatum</i>				+	4-8	+			+	+			30-80cm	2
Cedarlibani	<i>Cedrus libani</i>					9-11		+	+		5	Up to 40m			75
	<i>Rubia aucheri</i>				+	4-6		+		+	4,8			10-30cm	70
	<i>Vinca libanotica</i>				+	4-6	+			+	3,8			30-40cm	45
	<i>Astragalus emarginatus</i>				+	6-8	+		+		,52			5-15cm	10
	<i>Acer tauricum</i>				+	3-5		+	+		,42	5-6m			8
	<i>Geranium libani</i>				+	3-6	+			+	2			20-60cm	5
	<i>Sambucus ebulus</i>			+		5-7	+			+	2			60-100cm	5
	<i>Lonicera nummulariifolia</i>			+		6-7	+		+		2		60-120cm		5
	<i>Quercus brandtii look</i>			+		4-5		+	+		1,7	Up to 10m			4



	<i>Sorbus torminalis</i>			+		4-5		+	+		1	3-10m			3
	<i>Cicerbita mulgedioides</i>		+			6-9	+			+	+			50-100cm	2
	<i>Tanacetum cilicium</i>			+		<b>5-9</b>	+			+	+			50-100cm	1
	<i>Lathyrus libani</i>	+				5-6	+			+	+			20-80cm	1
Tree Area	<i>Berberis libanotica</i>					5-6		+	+		3,7		15-50cm		40
	<i>Acantholimon libanoticum</i>					6-9		+	+		2,8		±30cm		15
	<i>Astragalus gummifer</i>					5-8		+	+		2,8		20-60cm		15
	<i>Dianthus libanotis</i>			+		7-10	+			+	2,5			30-60cm	8
	<i>Astragalus cruentiflorus</i>			+		6-8	+		+		2		10-30cm		5
	<i>Helichrysum pallasii</i>				+	6-9	+			+	2			10-40cm	5
	<i>Rosa glutinosa</i>				+	6-7		+	+		2		20-50cm		5
	<i>Taraxacum syriacum</i>			+		6-11	+			+	1			10-30cm	3
Oak Tree E-slopes	<i>Quercus calliprinos</i>					2-4		+	+		3,8	±20m			45
	<i>Quercus infectoria latifolia</i>					3-4		+	+		3,2	10m			28
	<i>Astragalus gummifer</i>					5-8		+	+		3,1		20-60cm		27
	<i>Prunus korschinskyi</i>			+		3-4		+	+		3,1	5-10m			27
	<i>Centranthus longiflorus latifolius</i>					6-10	+		+		3			60-150cm	25
	<i>Juniperus oxycedrus</i>				+	3-6		+	+		2,8	Up to 10m			20
	<i>Sorbus flabellifolia</i>			+		5-6		+	+		1	Up to 5m			4
<i>Ziziphora capitata</i>				+	3-7	+			+	1			5-15cm	4	

#### **A.1.5.1.2.1.4.2 Qualitative evaluation of the habitats**

##### **A.1.5.1.2.1.4.3 Dynamic and ecological succession**

Some of the vegetal formations of Al-Chouf Cedar such as the old cedar stands are at the climax stages (stable) whilst the vegetation of the barren and rocky areas is subject to alternation of regressive dynamics when poaching and illegal grazing occur and progressive dynamics when protection is successful.

##### **A.1.5.1.2.1.4.4 Evaluation of the degree of artificialization**

The artificialization is observed as a result of the past human intervention (glades created by wood cutting and reduced cover of spontaneous cedar trees) and recent human interference (cedar tree planting in tree-line forms on man-made terraces).

##### **A.1.5.1.2.1.4.5 Spatial structure of the communities**

The spatial structure of the communities is well projected on the maps.

##### **A.1.5.1.2.1.4.6 Regeneration rate of the high ligneous formations**

The main high ligneous formations of the Al-Chouf Cedar are Cedar and Quercus trees. These formations are of very low regeneration rate that is mainly due to the climax reached stage. The other ligneous such as Wild fruit trees are considered of medium regeneration rate.

### A.1.5.2 MAMMALS

Mammal explorations in the country were shy and almost limited to around the middle of the twentieth century. They are fragmentary and provided little information on the mammals of Lebanon. Many species and sub-species were lacking or not yet mentioned in Lebanon till early seventieth. Between 1980 and 1985, Tohmé, G. and Tohmé, H. produced alone 33% of the known published papers on the Lebanese mammals. Whatsoever, the only documented data of the mammals of Al-Chouf Cedar Reserve apparently appeared in the report of Tohmé, H. that was prepared, on behalf of the Protected Areas Project at the Ministry of Environment, in 1999 by the NCSR. This report, which was based on inventory and surveys as well as brochures and other documents developed by the managing team of the reserve, produced a list of 31 mammals as shown in the Table (2) (Annex II) below:

#### 1.5.2.1 The Mammal species

##### 1.5.2.1.1 Selected species

The fine-filter selected 12 species: the most threatened and rare species *Canis lupus pallipes*, *Felis sylvestris tristrami*, *Hyaena hyaena syriaca* and *Mustella nivalis* and all the economic species (*Crocidura russula*, *Erinaceus europaeus*, *Myotis blythi omari*, *Pipistrellus kuhli ikhawanius*, *Pipistrellus pipistrellus pipistrellus*, *Rhinolophus ferrumequinum ferrumequinum*, *Rhinolophus hipposideros minimus* and *Suncus etruscus*), in particular the *Erinaceus europaeus concolor*. They deserve protection and monitoring for several reasons: the first four which occupy the top or sub-top of the trophic chain are in continuous decline since they are constantly persecuted by people due to lack of awareness. As for the *Erinaceus europaeus concolor*, it is an insectivorous of excellence and feeds on eggs and larvae of insects found in the soil. Its role is well known in controlling outbreaks of insects harmful to flora. The *Sus scrofa lybicus* is also selected for the damage it may cause to the roots of the cedar trees among others.

##### 1.5.2.1.1.1 Rare (10)

Species	English Name	Local Name	Localization		Abundance
			Habitat	GPS	
<i>Erinaceus europaeus concolor</i>	<b>Hedgehog</b>	Quonfoz	Especially under oak trees	N 33° 44' 571'' E 35° 43' 504''	Low
<i>Crocidura russula</i>	<b>Common White Toothed Shrew</b>		Wetsites		Very low
<i>Rhinolophus ferrumequinum ferrumequinum</i>	<b>Greater Horseshoe</b>	Ammash Kabir			

Rhinolophus hipposideros minimus	<b>Lesser Horseshoe</b>	Ammash Asghar			
<i>Myotis blythi omari</i>	<b>Lesser Mouse-Eared Bat</b>	Watwat	Mostly all over		Low
Pipistrellus pipistrellus pipistrellus	<b>Common Pipistrelle</b>				
<i>Canis lupus pallipe</i>	<b>Wolf</b>	Dib	Apparently all over	N 33° 45' 542'' E 35° 46' 304''	Extremely low
<i>Mustela nivalis</i>	<b>Weasel</b>	Ibn Ers	Apparently all over		Very Low
<i>Felis sylvestris</i>	<b>Wild Cat</b>	Hirr Barri	All over but mainly Ain el Lujja and above Kefrayya	N 33° 41' 672'' E 35° 44' 139'	Extremely Low
<i>Hyaena hyaena syriaca</i>	<b>Striped Hyaena</b>	Daba'a	All over		Very low

#### 1.5.2.1.1.2 Endemic (0)

Species	English Name	Local Name	Endemism	Localization		Abundance
				Habitat	GPS	

#### 1.5.2.1.1.3 Noteworthy (7)

Species	English Name	Local Name	Value	Localization		Abundance
				Habitat	GPS	
<i>Erinaceus europaeus concolor</i>	<b>Hedgehog</b>	Quonfoz	Economic Bio-indicator	Preferably under Cyprus oak trees	N 33° 44' 571'' E 35° 43'	Low

					504''	
<i>Crocidura russula</i>	<b>Common White Toothed Shrew</b>		Economic Bio-indicator	Wetlands of the site		Very low
<i>Rhinolophus ferrumequinum ferrumequinum</i>	<b>Greater Horseshoe</b>	Ammash Kabir	Economic Bio-indicator	All over		Low
<i>Rhinolophus hipposideros minimus</i>	<b>Lesser Horseshoe</b>	Ammash Asghar	Economic Bio-indicator	All over		Low
<i>Myotis blythi omari</i>	<b>Lesser Mouse-Eared Bat</b>	Watwat	Bio-indicator Economic	All over		Low
<i>Pipistrellus kuhli ikhawanius</i>	<b>Kuhl's Pipistrelle</b>	Khaffach	Bio-indicator Economic	All over		Very low
<i>Pipistrellus pipistrellus pipistrellus</i>	<b>Common Pipistrelle</b>					Low

#### 1.5.2.1.1.4 Introduced (Alien invasive) (0)

Species	English Name	Local Name	Origin	Localization		Abundance
				Habitat	GPS	

#### 1.5.2.1.1.5 Threatened (6)

Species	English Name	Local Name	Level of threat	Localization		Abundance
				Habitat	GPS	
<i>Rhinolophus ferrumequinum ferrumequinum</i>	<b>Greater Horseshoe</b>	Ammash Kabir	Global	All over		Low

Rhinolophus hipposideros minimus	<b>Lesser Horseshoe</b>	Ammash Asghar	Global	All over		Low
<i>Pipistrellus kuhli ikhawanius</i>	<b>Kuhl's Pipistrelle</b>	Khaffach	Global	All over		Very low
Pipistrellus pipistrellus pipistrellus	<b>Common Pipistrelle</b>		Global			Low
<i>Canis lupus pallipes</i>	<b>Wolf</b>	Dib	Threatened at all levels	Probably Jabal Barouk	N 33° 45' 542'' E 35° 46' 304''	Extremely low
<i>Hyaena hyaena syriaca</i>	<b>Striped Hyaena</b>	Daba'a	Globally and regionally threatened	All over		Extremely low

#### A.1.5.2.1.1.6 Useful information and details about the selected species

##### *Canis lupus pallipus* Grey Wolf

##### **Distribution**

The grey wolf lives in North America, once distributed widely in Europe, The species is found most countries of the middle east. Iraq, Jordan, Syria, Saudi Arabia, Kuwait, Yemen, Oman and UAE. This species was extinct from Europe and it ranges widely in the previous USSR, Asia Minor, Iran through to India.

**Lebanon:** It is highly Endangered in Lebanon due to hunting and poisoning as well as some management practices. Wolves are reported from Anti-Lebanon (Aarsal, Hermel and Ras Baalbak), Harbata, Aammiq, Maaser AlChouf, Qournet Alsawda, Ehden, Karm AlMohr, Niha and Tannourine in the north



Photo: Mounir Abi Saeed

##### **Population:**

This species is at high risk in its area of distribution. **In Lebanon:** Highly Endangered

**Chronology:** First reported from Aammiq by Georges and Henriette Tohmé when two were seen in winter 1973. Ghassan Ramadan-Jaradi and John Marsh found one road kill on 26 October 1997 on the main road bordering the swamp; whilst Mounir Abi Saeed saw another road kill near the swamp in February 2004.

##### **Identification:**

The wolves are quite similar to Jackals. They are much larger and heavier. There is much individual variation in color but in general the flank is beige darkening gradually towards the spinal crest and fading to creamy white on the side of the neck and cheeks. The ears are medium in size compared to German Shepherd dog they are shorter. The tail is short and fluffy. It weighs on average 35kgs and measures 1.3m.

##### **Habitat:**

Their habitat ranges from dense forests to desertic areas.

Hyaena hyaena syriaca <b>Striped Hyaena</b>
<b>Distribution</b>
The Striped hyaena lives in Africa From Morocco to Kenya and Tanzania. In Asia they are found in India, Nepal, Afghanistan, Iran and the Middle East.
<b>Lebanon:</b> It is threatened in Lebanon due to conflict with humans. Hyaenas are spread in most Lebanese villages. It is found on the coastal areas, Mount Lebanon and Beqaa region.

<b>Population:</b>
This species is at high risk in its area of distribution. <b>In Lebanon:</b> Threatened
<b>Identification:</b>
The coat color of the striped hyaena is gray with dark stripes on the body and legs. It has a well developed mane from neck to tail which is erected to enlarge the hyaena's size whenever it feels threatened. The striped hyaena rear legs are less developed than the front ones giving it the appearance of backward inclination. Its weight ranges between 25 and 55kgs; its height from 65 to 80cm and measures approximately 1m.
<b>Habitat</b>
Striped hyaenas are shy animals. They live solitary in dense forest or in rocky cave rich areas.

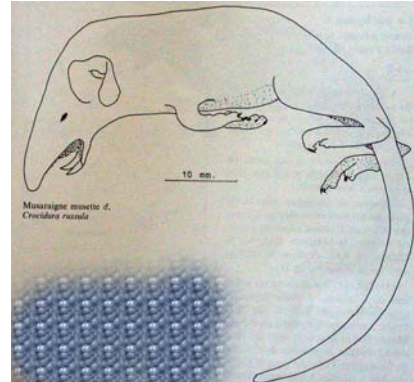
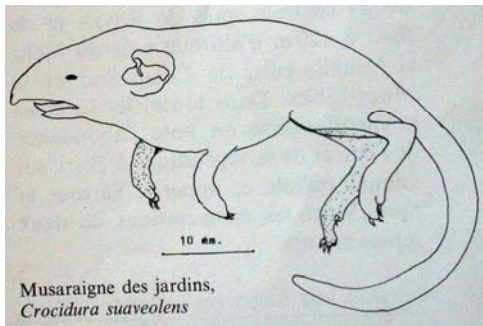


**Genus: *Crocidura*. *Crocidura suaveolens* & *Crocidura russula* Lesser & Common White Toothed Shrew.**

**Distribution**

This species is distributed in Europe, N. Africa, and Asia. In the Middle East they are found in Jordan, Palestine, Syria, Iraq, Saudi Arabia and Yemen.

**Lebanon:** These shrews are reported in Beqaa and Mount Lebanon.



Drawing by Dr. Tohme.

**Population:**

It is wide spread in its region. In **Lebanon:** Common

**Identification:**

This is a medium-sized shrew with a relative long, dark tail that exceeds half the length of the head and body. The pelage is uni-colored with considerable variation in color depending on soil and humidity. They have a blackish brown or gray coat.


**Habitat**

Its habitat ranges from steppe desert to the high mountains where it lives between cervices of sandstones or between rocks.

<i>Erinaceus europaeus concolor</i> <b>Hedgehog</b>
<b>Distribution</b>
<b>Middle East:</b> The subspecies is Widespread in most countries of the Middle East. The species is also found elsewhere in Africa and Asia and from the central Europe to the Caspian sea.
<b>Lebanon:</b> Common in Lebanon, especially in the coastal plain. Its habitat do not apparently exceed 1300 meters. Reported from Hadath, Kfarchima, Bsaba, Nahr Ibrahim, Saida, Jaj, Laqlouq, Baalbek, Zahleh, Chmistar, Sarafand, Tamnine Tahta, Barouk, Mokhtara, Rihane, Jezzine, Farayya, Koura and Tyre.


Photo: Mounir Abi Saeed
<b>Population</b>
In its areas of distribution, this animal is well represented. <b>In Lebanon:</b> Common.
<b>Chronology</b>
First reported and photographed from Aammiq by Ghassan Ramadan-Jaradi (autumn, 2000; pers. comm.).
<b>Identification</b>
The Hedgehogs have rounded bodies up to 13 in. (33 cm) long, very short tails, and pointed snouts; their backs and sides are covered with stiff spines and their undersides with coarse hair. They are usually brown and yellow in color. When frightened, a hedgehog rolls itself into a tight ball with its spines pointing outward; when rolled up it is invulnerable to almost any predator.
<b>Habitat</b>
The Hedgehog is well represented in cultivated or semi-desert areas. Also found in Pine and olive groves as well as in forest edges, gardens and parks.

<i>Myotis blythii</i> <b>Lesser Mouse-Eared Bat</b>
<b>Distribution</b>
This species ranges from Europe, NW Africa reaching eastern China. In the Middle East they are found in Syria, Palestine, and Iraq.
<b>Lebanon:</b> Lesser Mouse-Eared bat is reported in Aamchit, Harajel, and Faraya.
<b>Population:</b>
This species has an extensive distribution. <b>In Lebanon:</b> At risk due to agricultural practices.
<b>Identification:</b>
This is a large Mouse-eared bat. The tail is relatively long tail; the ears are tall, narrow and their tips bluntly rounded. The feet are short and the thumb is long. The pelage has a rather woolly texture. The hair on the back are longer than that of the belly
<b>Habitat</b>
They inhabit old bridges or holes not deeper than 15 – 20cm.

<p><b>Genus <i>Pipistrellus</i>. <i>P. pipistrellus</i> &amp; <i>P. kuhlii</i> Common &amp; Kuhl's Pipistrelle</b></p>
<p><b>Distribution</b></p> <p>The Pipistrelle bat is distributed in Europe and Africa. In the Middle East they are found in Jordan, Palestine, West Bank, Iraq, Syria, Kuwait, Saudi Arabia, and UAE.</p>
<p><b>Lebanon:</b> Common Pipistrelle is reported in Ammiqu swamp, Mashghara while Kuhl's bat is reported throughout the country.</p>

<p><b>Population:</b></p> <p>This species is abundant in its area of distribution. <b>In Lebanon:</b> At risk due to agricultural practices.</p>
<p><b>Identification:</b></p> <p>These are small Vespertilionid bats. The wings are relatively narrow, only the tip of the tail projects from the interfurcular membrane, the outer border of which is supported by well developed calcars. The pelage is fine, dense and silky.</p>
<p><b>Habitat</b></p> <p>They live in crevices in the walls and roofs of buildings.</p>

<i>Tadarida teniotis</i> <b>European Free-Tailed Bat</b>
<b>Distribution</b>
This species from the Canary Islands, Morocco, and the Iberian peninsula, eastwards through N. Africa and Southern Europe to Southern China, Taiwan and Japan. Pipistrelle bat is distributed in Europe and Africa. In the Middle East they are found in Jordan, Palestine, Iraq, and Saudi Arabia
<b>Lebanon:</b> European free-tailed bat is reported in Faraya.
<b>Population:</b>
This species has an extensive distribution. <b>In Lebanon:</b> At risk due to agricultural practices.
<b>Identification:</b>
This is a large Free-tailed bat of robust building, with large ears that are broadly rounded tips and very long narrow wings, The nostrils open ventro-laterally on the outer part of an elevated black pad. The pelage is dense soft and velvet, rather long on the throat.
<b>Habitat</b>
They inhabits narrow and inaccessible rock cervices.



<i>Sus scrofa</i> <b>Wild Boar</b>
<b>Distribution</b>
The Wild boar range from Palaearctic through south east Asia to Java and Solomon Islands. In Africa it occurs in Morocco, Algeria and Sudan. In the Middle East it is reported in Iraq, Syria, Jordan and Palestine.
<b>Lebanon:</b> Wild boars are very abundant in Lebanon and in some areas they are causing problems to farmers. They are reported in most Lebanese villages, excluding Beqaa region, starting from the coastal areas like Jbeil going up to the highest mountains in Ehden and Alchouf.

<b>Population:</b>
This species is well distributed. <b>In Lebanon:</b> Abundant
<b>Identification:</b>
The wild boar is a large pig with a medium tail length which is well covered with hair. The muzzle is very elongated and narrow. The feet have four well developed toes. Hair color shows some variation with adults but most are brown although some are blackish, grayish or even very pale. Their weight may reach 250- 300kgs.
<b>Habitat</b>
The wild boars are inhabitant of dense thickest forests, wooded hills and forests and in river valleys.

### A.1.5.3 BIRDS

In the Ornithology of Lebanon, Al-Chouf Cedar Reserve wasn't a direct target for ornithologists or birdwatchers of the past. The few cedars that were mentioned in a limited number of bird papers are of unknown localities, and Ehden that was very rarely cited in some manuscripts lies most probably out of the reserve. It was until nineties when Ramadan-Jaradi & Ramadan-Jaradi (1997, 1999) recorded bird species from Ehden Reserve and elsewhere around the reserve. The bird study that was carried out at Al-Chouf Cedar, by Karakira, M. for the NCSR in 1999 on behalf of the Protected Areas Project, produced the first comprehensive list for the birds of this area. Since then, only one ornithological paper has been published by Ramadan-Jaradi & Ramadan-Jaradi (2002) with mention to the features of some avian species of the site. Continuous but scattered visits continued to the reserve and its surroundings by Ramadan-Jaradi & Ramadan-Jaradi and produced new and more significant records (see Annex (3)).

However complete the annexed list may be, it must be kept in mind that there are still some gaps in the information about the species. This is generally due to the effect of variables of the natural processes. The list above may not reflect the exact status of certain species that are for example ranging between extremely rare to uncommon through scarce. Instead, it makes the difference between common and uncommon species.

Striking is that 18% (69 species) of the Lebanese bird species (375 species) do breed in Al-Chouf Cedar Reserve. These make 60% of the Lebanese breeding avifauna. Consequently there is an increase in the number of breeding species since at least 1999 reflecting as such the high diversity of the site but also the partial protection and conservation measures taken here by the managing team. This hypothesis is supported by the fact that most of the passage migrant species are also represented by winterers (resident species between mid-November – mid February).

Whatsoever, there are four globally threatened species *Aegypius monachus*, *Aquila heliaca*, *Falco naummani* and *Crex crex*; nine regionally threatened species: *Ciconia ciconia*, *Pernis apivorus*, *Neophron percnopterus*, *Gyps fulvus*, *Accipiter brevipes*, *Aquila clanga*, *Aquila pomarina*, *Falco cherrug* and *Falco biarmicus*; and five wholly or partially restricted species to the Middle East *Oenanthe finschii*, *Irania gutturalis*, *Hippolais languida*, *Sylvia mystacea* and *Serinus syriacus*. As for the nationally rare, indicator, economic and keystone species, they are six, whereas none of the birds of the list's species is found to be introduced or endemic species.

#### 1.5.3.1 The Bird Species

##### 1.5.3.1.1 Selected species

The used methodology and criteria to limit the study to a certain number of species are indicated in the Annex 7 far below. However, 17 species of birds are selected:

##### 1.5.3.1.1.1 Rare (3)

Species	English Name	Local Name	Localization		Abundance
			Habitat	GPS	
<i>Crex crex</i>	<b>Corncrake</b>	Salwa	Open areas		5-6 individuals/year

<i>Bubo bubo</i>	<b>Eagle Owl</b>	Bouma	Slight forested rocky slopes		4 records
<i>Hippolais linguida</i>	<b>Upcher's Warbler</b>	-	Forested areas		About 13 individuals/ year

### 1.5.3.1.1.2 Endemic (2)

Species	English Name	Local Name	Endemism	Localization		Abundance
				Habitat	GPS	
<i>Hippolais linguida</i>	<b>Upcher's Warbler</b>	-	To Middle East	Forest		Low 10-12 records
<i>Serinus syriacus</i>	<b>Syrian Serin</b>	Na'ar souri	To Middle East	Bushes, shrubs, scrubs		High Tens

### 1.5.3.1.1.3 Noteworthy (14)

Species	English Name	Local Name	Value	Localization		Abundance
				Habitat	GPS	
<i>Ciconia ciconia</i>	<b>White Stork</b>	Liqlaq	Birdwatching, pest control	All over, especially meadows		Very High c.2000/ year
<i>Coturnix coturnix</i>	<b>Quail</b>	Firri	Potential gamebird	Open areas		Very Low Possible unnoticed passage
<i>Buteo rufinus</i>	<b>Long-legged Buzzard</b>	-	Birdwatching, pest control	All over, especially at the reserve's entrance		Very Low Maximum 2 pairs
<i>Hieraetus fasciatus</i>	<b>Bonelli's Eagle</b>	Bonelli	Birdwatching, pest control, flagship	All over overhead		Very Low Only one pair
<i>Scolopax rusticola</i>	<b>Woodcock</b>	Djaj el Ard	Gamebird, pest control	Climax forested		Low



				area		7-10 individuals seen
<i>Alectoris chukar</i>	<b>Chukar</b>	Hajal	Gamebird	All over		High Several tens
<i>Cuculus canorus</i>	<b>Cuckoo</b>	Qayqab	Pest control of excellence	All over		Low 11 records only
<i>Streptopelia turtur</i>	<b>Turtle Dove</b>	Tirghal	Gamebird	Open woods		Medium Tens
<i>Turdus philomelos</i>	<b>Song Thrush</b>	Simmon	Gamebird	All over		Medium Tens
<i>Turdus iliacus</i>	<b>Redwing</b>	Simmon	Potential gamebird	All over		Low 10 records
<i>Turdus viscivorus</i>	<b>Mistle Thrush</b>	Simmon	Potential gamebird	All over		Low 14 records
<i>Parus caeruleus</i>	<b>Blue Tit</b>	Sin el Manjal Azrak	Pest control Birdwatching Bioindicator	Mainly western edges of forest		Low But high in the western corner of the reserve
<i>Serinus syriacus</i>	<b>Syrian Serin</b>	Na'ar Soury	Birdwatching Bioindicator	All over		Medium Tens
<i>Corvus cornix</i>	<b>Hooded Crow</b>	Qaq	Bioindicator	All over		High Several tens


#### 1.5.3.1.1.4 Introduced (Alien invasive) (0)


Species	English Name	Local Name	Origin	Localization		Abundance
				Habitat	GPS	


## 1.5.3.1.1.5 Threatened (6)


Species	English Name	Local Name	Level of threat	Localization		Abundance
				Habitat	GPS	
<i>Crex crex</i>	<b>Corncrake</b>	Salwa	Global	All over		Low 5-6 ind./year
<i>Ciconia ciconia</i>	<b>White Stork</b>	Liqlaq	Regional	All over, especially meadows		High c.2000/year
<i>Serinus syriacus</i>	<b>Syrian Serin</b>	Na'ar Soury	Regional	All over, mainly in glades and forest edges		Medium Tens
<i>Hippolais linguida</i>	<b>Upcher's Warbler</b>		Local	All over		Low 10-12 records
<i>Bubo bubo</i>	<b>Eagle Owl</b>	Bouma	Regional	All over, mainly rocky slopes		Very low Four records
<i>Parus caeruleus</i>	<b>Blue Tit</b>	Sin el Manjal Azrak	Local	All over, mainly western edges		Low But high in the western corner of the reserve

#### A.1.5.1.1.6 Useful information and details about the selected species

<b><i>Alectoris chukar</i> Chukar Partridge</b>
<b>Distribution</b>
<b>Middle East:</b> Resident in Middle Eastern Countries.
<b>Lebanon:</b> Common resident breeder over the country with peaks of up to thirty birds after breeding season. Recorded in most Lebanese mountains.

<b>Population</b>
In the 1970's and 1980's thousands of pure or hybrid birds were released in Lebanon, These bred well in captivity but their release threatened the survival of the wild Chukar. Those birds that had already been released have had a poor rate of reproduction in the wild so these hybrids will soon disappear. <b>In Lebanon</b> , wild Chukars count c.7,000 breeding pairs widespread at higher altitudes but uncommon across low hills and coastal areas.
<b>Identification</b>
Feral birds can increasingly be found in mountains, but are often overlooked. A Middle-eastern species which can be found in much of Turkey, including the Camlica Hills, Istanbul and also the hills of north-east Greece. Perhaps the easiest places to see them though are on some of the Aegean islands - they are particularly numerous on Aghios Efstratios, for example.
<b>Habitat</b>
Resident in rocky areas, especially in mountainous country but in some parts of its range also present down to sea level or in lowland scrub.

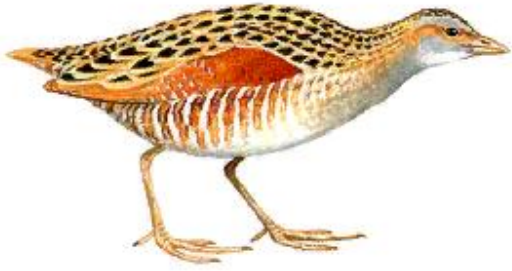
<b><i>Bubo bubo</i> Eagle Owl</b>
<b>Distribution</b>
<b>Middle East:</b> Resident. Quite widespread in Europe and Middle East but usually scarce and difficult to find.
<b>Lebanon:</b> Has not been proven to occur as a vagrant to Lebanon for over a century, but there are many recent records of calling birds which have taken up territories.

<b>Population</b>
10,000-13,000 breeding pairs, like the Barn Owl, widely ranging across the Europe, Asia and north Africa. Most abundant in Siberia, Norway and Finland, it occurs in most of mainland Europe. <b>In Lebanon</b> , tens of pairs were spotted during the last ten years, mainly in the Beqaa Valley, Barouk and Rihane Mountains.
<b>Identification</b>
What an impressive beast the Eagle Owl is. Ten times heavier than a Long-eared Owl, this bird is powerful enough to tackle prey as large as a small deer or a Capercaillie. At rest it is the only big owl with ear tufts. Even if these are flattened they are still distinctive, creating a frowning expression not found in other large owls. Their rich, orangey brown colours and flaming red eyes are further differences, giving the impression of a huge Long-eared Owl. In flight they are shorter tailed than the other large owls and the pointed head is usually obvious.
<b>Habitat</b>
Breeds and winters in rocky gorges or ridges, often amidst woodland.

<b><i>Buteo rufinus</i> Long-legged Buzzard</b>
<b>Distribution</b>
<p><b>Middle East:</b> A widespread breeding bird in Turkey but it can also be found in parts of Greece, Romania, Bulgaria and even Hungary, where a few pairs now breed on the Hortobagy.</p> <p><b>Lebanon:</b> Resident and passage migrant breeder in scattered areas of Lebanon and found to breed at the entrance of Horsh and on the eastern slopes of Al-Chouf Cedar Reserve.</p>

<b>Population</b>
10,000-13,000 breeding pairs, like the Barn Owl, widely ranging across the Europe, Asia and north Africa. Most abundant in Siberia, Norway and Finland, it occurs in most of mainland Europe. <b>In Lebanon</b> , About a total of 65 pairs identified in all areas of Lebanon.
<b>Identification</b>
In plumage, Long-legs look generally rufous, often becoming paler on the head and darker on the belly and with a plain orange tail which may appear translucent. Such features make them look quite different from most Buzzards but there is an eastern race of Common Buzzard, known colloquially as 'Steppe Buzzard' which can look just as rufous. Apart from the differences in shape, a Long-leg seen from below will have an unbarred belly, solid dark carpal patches and a tail which is either unbarred if it's an adult or faintly but evenly barred if it's a juvenile. More convincingly, from above, the same bird will have pale, rather greyish panels in the primaries and the tail will become paler towards the base so it looks almost white near the rump.
<b>Habitat</b>
Resident in areas of open country.


<b><i>Ciconia ciconia</i> White Stork</b>
<b>Distribution</b>
<b>Middle East:</b> Breeding summer visitor and common passage migrant.
<b>Lebanon:</b> Abundant and regular on both passages, over whole country. Recorded at Aaichyeh, Aammiq, Ainata, Azour, Beirut, Beiteddine, Beqaa Valley, Bikfaya, Byblos, Dalhoun, Damour, Deir Mimas, Fatre, Harissa, Hasrout, Jamhour, Jounieh, Krak des Chevaliers, Nabatyeh, Niha, Qaraoun, Rayhan, Tripoli and Tyre.

Drawing: <a href="http://www.birdguides.com">http://www.birdguides.com</a>
<b>Population</b>
The European population is estimated at about 100,000 pairs. Russian population 3500-4000 Turkish population 15000-35000. <b>In Lebanon:</b> Regular on passage with daily peaks between 30-10000 individuals.
<b>Identification</b>
It is unmistakable, with a white body, mostly black wings, red legs and a long red bill.
<b>Chronology:</b> First mentioned at Aammiq by MacFarlane (1978) and NCSR (1999). At least during the last 10 years, the number of individuals is generally constant from year to another ( <i>pers. obs.</i> ).
<b>Habitat</b>
Feeds mostly in fields and meadows.


<b><i>Coturnix coturnix</i> Quail</b>
<b>Distribution</b>
<b>Middle East:</b> Breeding summer visitor, widespread on passage and few overwinter.
<b>Lebanon:</b> Uncommon and localised migrant. Common passage migrant over most of the country. Few overwinter, mainly in the Beqaa valley. Recorded at Aammiq, Aichyeh, Aramta, Beirut, Beqaa Valley, Jiyeh, Joub Jannine, Kfarhouneh, Khaldeh, Mlikh, Ryhan, Tripoli, Palm Islands and Tyre.


Drawing: <a href="http://www.birdguides.com">http://www.birdguides.com</a>
<b>Population</b>
650 000-900 000 breeding pairs common across Europe but rare in the north. <b>In Lebanon:</b> The passing birds are in thousands whilst the winterers are very few and the summer breeders are widely fluctuating due to excessive hunting pressure.
<b>Identification</b>
The Quail is a tiny gamebird most likely to be mistaken for a half-grown young Partridge, but the male has a black and white head pattern which is mimicked in a duller brown version by the female. If you are lucky enough to flush one you'll see a dumpy, hump-backed, narrow-winged gamebird skimming low over the vegetation with quick, shallow wing-beats. More usually though, you'll hear its diagnostic call.
<b>Chronology:</b> First mentioned at Aammiq by MacFarlane (1978) and then by NCSR (1999). There is a recent tendency for wintering (pers. obs.) that may reflect stability conditions in winter over the site.
<b>Habitat</b>
Breeds in arable fields and long grass.


<b><i>Crex crex</i> Corncrake</b>
<b>Distribution</b>
<b>Middle East:</b> Widespread on passage throughout region.
<b>Lebanon:</b> Uncommon passage migrant over the country with peaks of up to six birds. Recorded at Aammiq, Beirut, Palm Islands, Tyre.

<b>Population</b>
87-97,000 breeding pairs widespread but uncommon across Europe and rare in the north. <b>In Lebanon:</b> The yearly recorded birds are apparently not exceeding a dozen.
<b>Identification</b>
If you are lucky enough to catch a glimpse it will probably be of a bird flying weakly away, with its rufous wings standing out and with its legs dangling behind it. Birds seen on the ground are quite distinctive, particularly the yellow bill and legs, grey facial stripes, dark back and rufous wings. They could almost be a cross between a Partridge and a Water Rail. (The distinctive call of the Corncrake is usually the only contact you will have in the European breeding ground with this elusive and declining species.)
<b>Habitat</b>
Found in cultivated lands, meadows and other open grassy lands.







<b><i>Cuculus canorus</i> Cuckoo</b>
<b>Distribution</b>
<b>Middle East:</b> Widespread and locally common throughout Europe and the Middle East.
<b>Lebanon:</b> Uncommon and widely distributed across all of Lebanon. Adults are usually present from April to early August, with juveniles leaving slightly later.

<b>Population</b>
More than a million birds widespread throughout Europe and unknown population size in the Middle East. <b>In Lebanon:</b> The yearly recorded birds are apparently not exceeding tens.
<b>Identification</b>
Cuckoos are blue-grey birds with white, closely barred underparts. Their short wings and long tail are suggestive of a Sparrowhawk, but the wings are clearly pointed more like a falcon. However, their fluttering flight with quick shallow wing-beats is distinctive, mainly because the wings are always held below the horizontal level. Juveniles are usually a dull dark brown, heavily marked with black and with a pale patch on the nape.
<b>Habitat</b>
Breeds on moorland, wasteground, reedbeds and woodland edges.


<b><i>Hieraetus fasciatus</i> Bonelli's Eagle</b>
<b>Distribution</b>
<b>Middle East:</b> The adults are very faithful to their breeding sites throughout the year in all Middle Eastern countries
<b>Lebanon:</b> The adults are very faithful to their breeding sites throughout the year so places such as the Jabal Aitou in the North or Kfarhim above Multaqa Al_Nahreïn are usually reliable. Young birds move about more and are therefore less predictable.

<b>Population</b>
820-900 breeding pairs. Most of these live in Spain, Portugal, France, Turkey and Greece. <b>In Lebanon:</b> The yearly recorded birds are apparently around ten pairs.
<b>Identification</b>
The adults are easy to identify. There are several medium-sized raptors with black and white underwing markings but Bonelli's don't have completely white coverts like Booted Eagle and Egyptian Vulture or black carpal patches like Ospreys. Instead their coverts are mostly dark, contrasting with a variable amount of white at the leading edge of the wing. The overall impression is usually of a raptor which is relatively dark on the underwing, but with a startlingly white head, body and forewing. They are equally distinctive from above, being the only medium-sized raptor with a pale patch on the back, though this can vary in size. The juveniles are pale rufous below, recalling Long-legged Buzzard in colour but the eagle is larger, with broader, more rectangular wings, a longer head and tail and no dark carpal patches. Sub-adult Bonelli's may be neither white-bodied nor rufous and may have to be identified by shape alone; the combination of long tail, long head and straight rear edge to the wing is usually distinctive enough but look also for a diagnostic black band across the middle of each wing.
<b>Habitat</b>
Nests on rocky cliffs and therefore associated with mountains and gorges. In winter, immature birds disperse to lower altitudes and may be seen by marshes.


<b><i>Hippolais languida</i> Icterine Warbler</b>
<b>Distribution</b>
<b>Middle East:</b> Breeds in hilly areas in southern Turkey such as on the plateau areas above Durnalik and Isikli, near Gaziantep.
<b>Lebanon:</b> Very scarce passage migrant in mid-April–late May and <u>late August–late October</u> , in a wide variety of habitats.

<b>Population</b>
1 000 breeding pairs in southern Turkey, part of a larger population found in the Middle East, and further afield in Afghanistan. <b>In Lebanon:</b> Not less than 200 pairs recorded on yearly basis in a variety of habitats.
<b>Identification</b>
In plumage, there's not much difference between Upcher's and the much commoner Olivaceous Warbler although its worth looking for the darker tail and relatively darker wings of the Upcher's which contrast with the paler upperparts. With care you may also notice that the tips of the tertials are unevenly spaced on an Upcher's Warbler, as if there's one missing. The most obvious difference between the two species is in build, since Upcher's looks distinctly big-headed and bull-necked whereas the Olivaceous is the slimmest most pointed-looking of all the Hippolais Warblers. Also, Upcher's sometimes waves its dark tail around in circular motions, a habit shared with the Olive-tree Warbler but not the Olivaceous.
<b>Habitat</b>
Breeds in rocky, hilly areas with sparse bushes although they also occur lower down in orchards and olive groves.

<b><i>Parus caeruleus</i> Blue Tit</b>
<b>Distribution</b>
<b>Middle East:</b> Widespread and numerous in most of Europe and in Turkey.
<b>Lebanon:</b> very scarce passage migrant in mid-April–late May and <u>late August–late</u> October, in a wide variety of habitats. At least four pairs resident in Ehden Forest and four fledglings were observed being fed on 17 June 1998. Subsequently, a local inhabitant of the nearby village of Baslouquit reported that Blue Tit had nested in the wall of his house, and showed the hole, which appeared too small for Great Tit <i>P. major</i> . This breeding record fills a gap between the populations in south Turkey (contiguous with main range) and the isolated population of north-west Jordan (Andrews 1995). In addition, one at Jeita Caves in April 2000 was observed repeatedly flying from trees to the underside of a two-storey parking lot overlooking the river (A. Springer pers. comm.).

<b>Population</b>
16-21 million breeding pairs widespread across Europe, including Turkey (representing 75% of this species range). <b>In Lebanon:</b> a small population is found breeding at Al-Chouf Cedar (Apparently, its southern limit of distribution).
<b>Identification</b>
The striking Blue on the wings, tail and especially on the crown make the Blue Tit an easy bird to identify. It is also the only Lebanese tit to have a dark stripe through the eye, a feature by which the yellower juveniles can be identified.
<b>Habitat</b>
Breeds and winters in woods, parks, orchards, hedgerows and gardens.


<b><i>Scolopax rusticola</i> Woodcock</b>
<b>Distribution</b>
<b>Middle East:</b> An extremely secretive woodland species, usually only seen when flushed. Large numbers of birds arrive from mid-October onwards and are often seen at different localities.
<b>Lebanon:</b> Winterer in most woodlands with preference to Al-Chouf Cedar.

<b>Population</b>
The population of Europe (excluding Russia) is estimated at between 500-700,000 pairs. <b>In Lebanon:</b> small numbers occur during migration. Wintering figures are much higher but reliable estimates have not been made.
<b>Identification</b>
The Woodcock is fat-bodied and rather round-winged and can look rather owl-like but, of course, owls don't have long pointed bills. A big, bulky, brown bird flushed from a woodland floor is more likely to be a Woodcock than an owl and the rich red-brown plumage, rapid zig-zagging flight and long bill will confirm this. At rest a Woodcock is easily told from a Snipe because the head stripes go across the top of the crown rather than along it.
<b>Habitat</b>
Winters in woods, parks, orchards, hedgerows and gardens but mainly in woodland with ground cover and damp areas. Feeds in nearby fields after dusk.


<b><i>Serinus syriacus</i> Syrian Serin</b>
<b>Distribution</b>
<b>Middle East:</b> Resident, dispersive, migrant to partial migratory and winterer.
<b>Lebanon:</b> Resident augmented by migrants and winterers. Reported from Aammiq, Aichyeh, Ain Zhalta, Ainata, Anti-Lebanon, Aramta, Azour, Baalbek, Barouk, Bcharre, Bmouhreh, Ehden, Hermon, Jaj, Jebel Barouk, Kammouha:, Kefraya, Kfarhouneh, Masser El Schouf, Mlikh, Ryhan, Tannourine, Tyre and Yammouna.

<b>Population</b>
Numbers of this Middle Eastern bird are not known. Instead, the average number of breeding pairs in suitable habitats of Lebanon is 14 (between 8.29 and 20.7).
 <b>identification</b>
Relatively paler and tail slightly longer than in European Serin. Yellowish washed with grey on the upper parts, head and chest. The front and the ocular circle as well as the upper tail and the wing bares are more yellowish.
 <b>habitat</b>
Nests on hill's slopes with shrubs, bushes, cedar or juniper trees. Winters at lower altitudes in bottom of valleys or in cultivated lands.

<b><i>Streptopelia turtur</i> Turtle Dove</b>
<b>Distribution</b>
<b>Middle East:</b> Chiefly summer breeder and migrant.
<b>Lebanon:</b> Fairly widespread but uncommon summer breeder and very common passage migrant across the country. Recorded at Aammiq, Aichyeh, Aramta, Arz el Chouf, Barouk, Beirut, Damour, Deir el Qamar, Hermel, Kefraya, Kfarhouneh, Khaldeh, Mlikh, Palm Islands, Qaa, Qaraoun, Sit Chawaneh and Tyre.

Drawing: <a href="http://www.birdguides.com">http://www.birdguides.com</a>
<b>Population</b>
About 2 million breeding pairs across most of Europe. Perhaps also as many as 5 000 000 in Turkey alone. <b>In Lebanon:</b> There are about 500 pairs in three localities: Qaa, Hermel and eastern slopes of Jabal Barouk..
<b>Identification</b>
Turtle Doves are similar in size and shape to a Collared Dove although they have a shorter tail, more pointed wings and a more darting agile flight. The chequered black and rufous upper parts are diagnostic and easily seen. Look also for their darker underwing, the narrow white border around the tail and the black and white collar patches like the gill slits of a dog-fish.
<b>Chronology:</b> First recorded at Aammiq by NCSR (1999). There is increase in numbers in recent years, probably due to conservation effort ( <i>Pers. obs.</i> ).
<b>Habitat</b>
Breeds in young woodlands, copses, hedgerows and scrub.

<b><i>Turdus iliacus</i> Redwing</b>
<b>Distribution</b>
<b>Middle East:</b> Occurs in large numbers in many parts of central and southern Europe and Middle East in winter.
<b>Lebanon:</b> scarce passage migrant in mid-February–late March and early November–mid-December and commoner in winter from early December–early February. Most frequently recorded in montane orchards, olive groves, open cedar groves, open mixed woodland, open country and cultivation. Rare in Beqaa and on the coast.

<b>Population</b>
5-7 million breeding pairs mostly in Scandinavia. The wintering population in Europe and Middle East, however, can reach at least a 1500 000 birds. <b>In Lebanon</b> , the records are not enough to estimate the wintering population.
<b>Identification</b>
The Redwing most closely resembles the Song Thrush but is best identified by the obvious buff stripes over its eye and through the moustache. These features are often more obvious than the red flanks and red underwing which give the species its name.
<b>Habitat</b>
Winters in hedges, fields, and gardens.



<b><i>Turdus philomelos</i> Song Thrush</b>
<b>Distribution</b>
<b>Middle East:</b> Widespread and numerous in most of Europe, although in many areas of southern Europe and Middle East they are restricted to hilly or mountainous regions.
<b>Lebanon:</b> very common passage migrant in early October–late November and mid-February–early April and an uncommon to scarce winter visitor late November–late February. Recorded in orchards, olive groves, open cedar groves, cultivation, maquis, isolated trees and around Ammiq swamp. Rare on the coast.

<b>Population</b>
14-18 million breeding pairs widespread across north-western Europe but rare in Spain, Italy and Greece. Finland, Germany, Sweden and Britain support the largest numbers. In Middle East, the figures are unknown. <b>In Lebanon</b> , the records are not enough to estimate the wintering population.
<b>Identification</b>
Its brown plumage and speckled chest is typical of a thrush. It lacks the white eye stripes of a Redwing and so is most easily mistaken for a Mistle Thrush. The Song Thrush, however, is smaller, more neatly proportioned, with warm brown upperparts and a rather dark face. It lacks the white tips to the corners of the tail and the white edges to many of the wing feathers shown by a Mistle Thrush. The underwing coverts are clearly orange, but not as deep and red as in a Redwing, which is a potential source of confusion.
<b>Habitat</b>
Winters in gardens, farmland, woodland and hedges.

<b><i>Turdus viscivorus</i> Mistle Thrush</b>
<b>Distribution</b>
<b>Middle East:</b> Widespread and numerous in most of Europe, although in many areas of southern Europe and Middle East they are restricted to hilly or mountainous regions.
<b>Lebanon:</b> very scarce and local migrant breeder to remote areas of the north, mainly in wooded parkland of fir at Qammouha, <i>Quercus cilicica</i> at Fneideq and cedar at Karm Al Mohr, near Ehden. Uncommon to scarce on passage and common in winter from late October–late March in open montane woodland.

<b>Population</b>
2-3 million breeding pairs in Europe extending eastwards to Russia. <b>In Lebanon,</b> the records are not enough to estimate the wintering population but the known breeding population is limited to c.25 pairs.
<b>Identification</b>
The Mistle Thrush is a big, bold, aggressive bird, larger than a Blackbird and more fat-bellied, longer-tailed and smaller-headed than other thrushes. Its upperparts are paler, more grey-brown than on a Song Thrush and there are white edges to many of the wing feathers and the corners of the tail. The face is generally paler making the dark eye more prominent and giving a 'wide-eyed' expression.
<b>Habitat</b>
Breeds in woods, parks, gardens and orchards. Also found in winter in fields and moorland edges.

#### A.1.5.4 REPTILES AND AMPHIBIANS

Apparently there is no major herpetological work conducted at Al-Chouf Cedar Nature Reserve prior to 1998 when the author of this section established the first prioritized list of Al-Chouf Cedar herpetofauna (Hraoui-Bloquet in Tohmé et al., 1999). In 2002, Hraoui-Bloquet et al. published a comprehensive paper on the distribution of the herpetofauna species over the Lebanese territories (including Ehden). Some old monographs are also known for the region (Lebanon and Syria): Angel, 1936; Boulanger, 1923; Lortet, 1883; Muller and Wettstein, 1933; Werner, 1939; Wettstein, 1928. Other recent works on the Lebanese herpetofauna have been published by Bosch (1998) and Bosch et al (1998).

These works have resulted together with the recent field research undertaken by Souad Hraoui Bloquet in a species list shown in Annex (4) below:

The list of herpetofauna species comprises 28 species distributed over 13 families. Only the *Chamaeleo chamaeleon* is globally threatened whilst the regionally threatened *Salamandra infraimmaculata infraimmaculata*, *Bufo viridis*, *Rana levantina*, *Hyla savignyi*, *Testudo graeca terrestris*, *Hemidactylus turcicus*, *Cyrtopodion kotschyi orientalis*, *Chamaeleo chamaeleon*, *Lacerta laevis laevis*, *Platiceps najadum dahlii*, *Malpolon monspessulanus insignatus*, *Hierophis jugularis*, *Natrix tessellata tessellate*, *Vipera bornmuelleri*, *Vipera palestinea* and *Macrovipera lebetina* are limited to 16 species (57% of the Hoersh Ehden Reserve's herpetofauna). Two reptiles *Vipera bornmuelleri* and *Lacerta media wolterstorffi* are endemic but the second is also regionally threatened. The uncertain status of 4 species *Cyrtopodion amictopholis*, *Vipera palestinea*, *Elaphe sauromates* and *Macrovipera lebetina* indicates that further field verification is needed to fill the gaps found in the acquired knowledge.

#### 1.5.4.1 The Herpetofauna Species

##### 1.5.4.1.1 Selected species

The used methodology and criteria to limit the study to a certain number of species are indicated in the Annex 7 far below. However, the fine filter had selected 10 species (one amphibian which belongs to the order of Urodela and nine reptiles which belong to the orders of Chelonia and Squamata). These species that are distributed over eight families share the following categories:

##### 1.5.4.1.1.1 Rare (3)

Species	English Name	Local Name	Localization		Abundance
			Habitat	GPS	
<i>Chameleo chamaeleon restricta</i>	<b>Chameleon</b>	Harbaya or Chakhteba khteh	Trees & Bushes in the forest		Low
<i>Testudo graeca terrestris</i>	<b>Grec Tortoise</b>	Sulhafat arde	Shrubby areas		Low
<i>Salamandr</i>	<b>Fire</b>	Salamand	Damp		Low

<i>a infraimma culata infraimma culata</i>	<b>Salamander</b>	er	woodland for juveniles and adults -Aquatic habitat for larva		
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## 1.5.4.1.1.2 Endemic (2)

Species	English Name	Local Name	Endemism	Localization		Abundance
				Habitat	GPS	
<i>Lacerta media wolverstorffi</i>	<b>Green lizard</b>	Suhliat Khdra'a	Regionally	Moist		Medium
<i>Vipera bornmuelleri</i>	<b>Bornmuelleri's viper</b>	<b>Afa'a Al Jabal</b>	To Lebanon Mountains	Alpine Habitat (Rocky and Jord vegetation)		Medium

## 1.5.4.1.1.3 Noteworthy (9)

Species	English Name	Local Name	Value	Localization		Abundance
				Habitat	GPS	
<i>Salamandra infraimmaculata infraimmaculata</i>	<b>Fire salanander</b>	Salamander	Pest control	Damp woodland of the forest		Low?
<i>Chameleo chameleon restricta</i>	<b>Chameleon</b>	Harba'a	Pest control	Trees, Bushes in the forest		Low
<i>Lacerta media wolverstorffi</i>	<b>Green lizard</b>	Suhleia Khdra'a	Pest control	In the lower part of the reserve, near the stream and restaurant		High
<i>Cyrtopodion kotschy orientalis</i>	<b>Tree Gecko</b>	Abou breiss al shajar	Pest control	In all the forest		Medium
<i>Laudakia stellio stellio</i>	<b>Hardun</b>	Hardun	Pest control	Rocky part with oak and pine trees in		High

				the lower part of the reserve and near the restaurant		
<i>Platiceps najadum dahlii</i>	<b>Small whipe snake</b>		Pest control	?		Medium?
<i>Hierophis jugularis</i>	<b>Large whipe snake</b>	Hanash asswad	Rodent control	Principaly the lower part of the reserve and its boundaries		Medium
<i>Malpolon monspessulanus insignitus</i>	<b>Montpellier snake</b>	Hayat montpellier	Rodent control	Principaly the lower part of the reserve and its boundaries		High
<i>Vipera bornmuelleri</i>	<b>Bornmuelleri's viper</b>	Afa'a Al Jabal	Rodent and lizard control	Rocky and mountainous vegetation		Medium

#### 1.5.4.1.1.4 Introduced (Alien invasive) (0)






Species	English Name	Local Name	Origin	Localization		Abundance
				Habitat	GPS	






#### 1.5.4.1.1.5 Threatened (5)

Species	English Name	Local Name	Level of threat	Localization		Abundance
				Habitat	GPS	
<i>Salamandra infraimmaculata infraimmaculata</i>	<b>Fire salanander</b>	Salamander	Regionally	Damp woodland of the forest		Low
<i>Testudo graeca terrestris</i>	<b>Greec tortoise</b>	Soulhafat	Regionally	In the lower part of the reserve		Medium?
<i>Chameleo chameleon restricta</i>	<b>Chamelon</b>	Harba'a	regionally	Trees & Bushes		Low






<i>Cyrtopodion kotschy orientalis</i>	<b>Tree Gecko</b>	Abou breiss al shajar	Nationally or local	In all the forest (Trees & Rocks)	Medium
<i>Platiceps najadum dahlii</i>	<b>Small whipe snake</b>	Nashabieh	Nationally	In the lower part (rocky with oak and pine trees)?	Medium?
<i>Hierophis jugularis</i>	<b>Large whipe snake</b>	Hanash asswad	Nationally	In the lower part of the forest (Rocky part with oak and pine trees) & the boundaries.	Medium






#### A.1.5.4.1.6 Useful information and details about the selected species






<i>Chameleo chameleon repticrista</i> <b>Common chameleon</b>	
 <b>distribution</b>	
<b>Middle East:</b> This species is also present in Syria, Jordan, Palestine, Israel, Iraq... where it is common.	
<b>Lebanon:</b> The common chameleon is observed in Lebanon from the sea shore to c.1600 m of altitude. This species of lizard is widespread in all the regions of Lebanon (Bekaa, Mount Lebanon, Anti-Lebanon and from the north to the south of the country).	
	
Photo by Jan Van Der Voort	
 <b>population</b>	
The population size of this species is not well known in the Middle East, <b>In Lebanon:</b> the abundance is medium. This arboreal species is threatened in Lebanon, mainly due to the uncontrolled use of pesticides.	
 <b>identification</b>	
The body and head are bilaterally compressed, tail prehensile, prominent eyes with 180 degrees vision field. Grey olive to brownish with light dots on the 2 sides of the body, placed in 2 rows. Changes color according to mood and background. Adult size 12 cm.	
<b>Chronology:</b> Reported from Aammiq for the first time by R. Sadek in his list of 1986. Also found in the works done in 1999 by S. Hraoui-bloquet.	
 <b>habitat</b>	
In agriculture areas, woodlands, orchards and other tree areas. It is arboreal (living on trees, bushes...). It goes on ground for hibernation during cold seasons or to lay eggs on ground during autumn. Its diet is mostly insects.	

<i>Laudakia stellio stellio</i> <b>Hardun</b>	
 <b>distribution</b>	
<b>Middle East:</b> This species is widespread in Lebanon, Syria, Palestine, Egypt, Jordan, Iraq, Turkey ...	
<b>Lebanon:</b> Widespread and very common. Lives in rocky areas and woodlands inhabitant. Breed on land in spring. Occurs from sea shore up to 2200 m. of altitude.	
	
Photo by Dr. Riyad Sadek	
 <b>population</b>	
The population size of this species is not well known in the Middle East, <b>In Lebanon:</b> the abundance is high. This arboreal species is persecuted in Lebanon mainly by apiculturists.	
 <b>identification</b>	
The body and head compressed, gular fold, dorsolateral folds, toes compressed, scales of tail arranged in spiny rings. Spiny and keeled dorsal and dorsolateral scales, ventral scales smooth. Color is grey with black and creamy dorso vertebral blotches.	
Chronology: It was cited for the first time at Aammiq by R. Sadek (1986).	
 <b>habitat</b>	
Rocky areas and woodlands (maquis, garrigue, fruit trees...) Diet mostly insects (it likes bees and it is not appreciated by apiculturists) and sometimes it eats fruits (cherry , black berries...).	









<i>Malpolon monspessulanus insignitus</i> <b>Montpellier snake</b>	
 <b>distribution</b>	
<b>Middle East:</b> Common and widespread in Syria, Palestine, Israel, Jordan ... It occurs in North Africa, from Algeria to Egypt, Arabian Peninsula, Southeastern Europe, Turkey and Iran....	
<b>Lebanon:</b> It is very common and widespread in open areas and field edges. Observed from the sea shore to about 1700 m in altitude.	
	
Photo by S> Bloquet	
 <b>population</b>	
The population size of this species is not well known in the Middle East or <b>In Lebanon</b> but the abundance seems to be high.	
 <b>identification</b>	
It is a colubridae but it has a rear fang to inoculate venom, adult size can reach 160 cm or more, Pupil of eye round, dorsal surface of snout with longitudinal concave furrow, color uniformly steel-gray dorsally. During reproduction period the throat of the male becomes red to orange.	
<b>Chronology:</b> First reported from Aammiq in 1986 by R. Sadek and then by S. Hraoui-Bloquet in 1999.	
 <b>habitat</b>	
Field edges, open fields, sunny shrubland. It is diurnal and feeds on birds, lizards and small mammals	





<i>Hierophis jugularis</i> <b>Large whipe snake (Black snake, Hannash asswad)</b>	
 <b>distribution</b>	
<b>Middle East:</b> Common and widespread in Syria, Palestine, Israel, Northern Iraq, Southern Turkey,...	
<b>Lebanon:</b> It is very common and widespread in Lebanon, it is recorded from sea shore to 1800m of altitude	
	
Photo by Dr. Riyad Sadek	
 <b>population</b>	
The population size of this species is not well known in the Middle East. <b>In Lebanon</b> it appears to be abundant.	
 <b>identification</b>	
It is a non venomous colubridae. Adulte size can reach 300 cm, pupil of eye rounded, tail long, adults uniformly black, subadults brownish black, throat and abdomen sometimes salmon red. It is diurnal , its diet is mainly small mammals, lizards, birds.	
<b>Chronology:</b> First reported from Aammiq in 1999 by S. Hraoui-Bloquet and then by S. Hraoui-Bloquet <i>et al.</i> in 2002.	
 <b>habitat</b>	
Wide variety of places.	

<i>Salamandra infraimmaculata infraimmaculata</i> Salamander	
 <b>distribution</b>	
<b>Middle East:</b> Common and widespread in most countries of the Middle East. This species is similar to <i>Salamandra salamandra</i> ( <b>fire salamander</b> ) living in Europe	
<b>Lebanon:</b> Common and widespread. Reported from most of fresh water bodies (during reproduction period) and from damp woodland out of this period. This species is generally found from 400m to 1800m of altitude.	
	
Photo by R. Sadek	
 <b>population</b>	
The population size of this species is not well known in the Middle East or <b>In Lebanon</b> but the abundance seems to be medium.	
 <b>identification</b>	
This species possesses 2 large parotoid glands that secrete toxic substance. The tail is cylindrical and shorter than the body. The latter is robust and stocky. The color is black with irregularly yellow spots on the back.	
<b>Chronology:</b> First reported from Al-Chouf Cedar in 1999 by S. Hraoui-Bloquet and then by R. Sadek in 2000.	
 <b>habitat</b>	
The Salamander is viviparous. Females in water deliver the larvae at the stage of external gills where they live and achieve metamorphosis. Juveniles and adults leave water bodies to live in damp region. During the daytime, they remain under tree barks, stones, rocks, etc. They are active at night. In autumn and in spring they are also observed active during daytime after rain. Main diet is insects.	













<i>Testudo graeca terrestris</i> <b>Greek terrestrial tortoise</b>	
 <b>distribution</b>	
<b>Middle East:</b> Widespread in most countries of the Middle East (Lebanon, Syria, Jordan, Palestine , Iran, Iraq....).	
<b>Lebanon:</b> Common and widespreade. Reported from sea shore to c.1300 m of altitude.	
	
Photo by S. Hraoui-Bloquet	
 <b>population</b>	
The population size of this species is not well known in the Middle East or <b>In Lebanon</b> but the abundance seems to be medium.	
 <b>identification</b>	
Head covered by shields, digits not webbed. Submarginals absent. Tail not flattened . Hindlimbs elephantine. Forefeet with five claws. Supracaudal single. Head uncolored tan or gray.	
<b>Chronology:</b> First reported from Al-Chouf Cedar in 1999 by S. Hraoui-Bloquet and then by R. Sadek in 2000.	
 <b>habitat</b>	
In grasslands, maquis, guarrigue, cultivated areas, semi aride zones ( like in some regions of the Bekaa Valley). The species is diurnal, oviparous and vegetarian. Many individuals from Syria are sold in Lebanon.	

<i>Lacerta media wolterstorffi</i> <b>green lizard</b>
 <b>distribution</b>
<b>Middle East:</b> Also common in Syria, Palestine, Israel, Jordan
<b>Lebanon:</b> Common and widespread in Lebanon. It is the largest among the lacertidae of the country. Recorded between 500 and 1800 m of altitude in moist zones.

Photo by S. Hraoui-Bloquet
 <b>population</b>
The population size of this species is not well known in the Middle East or <b>In Lebanon</b> but the abundance seems to be medium.
 <b>identification</b>
It is a strong lizard, collar well developed and strongly serrated, femoral pores present. Tail very long. Ventral plates trapezoidal, with notches between plates. Adults are green with small black blotches on back and laterally; young and juveniles are green with four longitudinal brown lines.
<b>Chronology:</b> First reported from Al-Chouf Cedar in 1999 by S. Hraoui-Bloquet and then by R. Sadek in 2000.
 <b>habitat</b>
In moist zones, cultivated and agriculture lands, forests, grasslands, near streams or rivers. It climbs trees and bushes. It is diurnal and its diet is made from insects.

<i>Vipera bornmuelleri</i> <b>Bornmuelleri's Viper</b>	
 <b>distribution</b>	
<b>Middle East:</b> Recorded from Mount Hermon	
<b>Lebanon:</b> This species is apparently endemic to Lebanese mountains	
	
Photo by S. Hraoui-Bloquet	
 <b>population</b>	
The population size of this species is not well known. This species which is endemic to Lebanese Mountains is found at c.1800m, namely from Sannine, Ayoun El Siman, Ehden and Bcharry.	
 <b>identification</b>	
Venomous, 50cm length, pupil of eye vertically elliptic, tail very short, the color is light brown with dark alternated mediodorsals patterns, it is active in evening and feeds mainly on lizards and small mammals.	
<b>Chronology:</b> First reported from Al-Chouf Cedar in 1999 by S. Hraoui-Bloquet and then by R. Sadek in 2000.	
 <b>habitat</b>	
Rocky and mountainous vegetation of the Alpine habitat	



<i>Cyrtopodion kotschy orientalis</i> <b>Tree Gecko</b>	
 <b>distribution</b>	
<b>Middle East:</b> Recorded in Jordan and Palestine	
<b>Lebanon:</b> common and widespread in the Lebanon from the littoral to c.1500m altitude.	
	
Photo by R. Sadek	
 <b>population</b>	
The population size of this species is not well known but is qualified abundant at least in Al-Chouf Cedar	
 <b>identification</b>	
A small gecko with vertically elliptic pupil, body covered with tubercles, adhesive lamella under toes and grey with dark transversal and irregular bar lines on the back.	
<b>Chronology:</b> First reported from Al-Chouf Cedar in 1999 by S. Hraoui-Bloquet and then by R. Sadek in 2000.	
 <b>habitat</b>	
Lives in trunks and branches of trees. The body matches their colour of the barks or other supports as a mean of camouflage. This nocturnal insectivorous is also found in rocky areas and on house walls.	

<i>Platiceps najadum dahlia</i> <b>small whip snake</b>	
 <b>distribution</b>	
<b>Middle East:</b> Occurs in Syria, Iraq, Cyprus, east through Turkey, south through Balkans, Yugoslavia and Bulgaria.	
<b>Lebanon:</b> Uncommon and limited to high altitudes, mainly above 1200 meters.	
	
Photo by S. Hraoui-Bloquet	
 <b>population</b>	
The population size of this species is not well known but seems to be low.	
 <b>identification</b>	
This snake reaches 50cm, no venomous, pupil of eye rounded, coloration more or less uniform except for neck region that may bear ocellae that become smaller in size posteriorly, no dark strip through eye, no collar band.	
<b>Chronology:</b> First described by S. Hraoui-Bloquet in 1999 and then by R. Sadeq in 2000.	
 <b>habitat</b>	
Lives in a wide variety of habitats.	





### A.1.5.6 The terrestrial insects




This part concerns the terrestrial insects or others, which are at their terrestrial stage of life, with particular attention given to the mega-insects. Mr. Bashar Merheb who was guided by several entomologists, mainly Dr.Hani Abdul Noor and Dr. Ali Bayan, carried out the field study in the Al-Chouf Cedar site. Mr. Bashar Merheb takes all photos of insects whereas some of the observed specimens (marked with [\*]) were examined in the Entomology museum-Lebanese university-Section II.





The encountered insects at Al-Chouf Cedar figure in the Annex 5 where the identification of insects is sometimes limited to the family level only. This is due to lack of specialized experts. However, the species identification is compensated here by photos taken from the studied site.




#### Summary status of the observed insect specimens at Al-Chouf Cedar.

\* denotes verified specimen through comparison with the Lebanese University collections.




Order	Family	Scientific name	density	abundance
Coleoptera	Cicindellidae Length: 1.5 mm.	 <i>Cicindella sp</i>	low	Rare
Coleoptera	Carabidae Length: 1.6 mm.	 <i>Nebria hemprichi</i> (klug1832)	low	Rare
Coleoptera	Cerambycidae Length: 1 mm.		*	





		 photo by B. Merheb		
		<i>Calamobius filum</i> (Rossi,1790)		
Coleoptera	Cerambycidae	<i>Phytoecia virgule</i> (Charpentier,1825)	*	
Coleoptera	Scarabeidae	<i>Oruceus nasicornis</i> (Linnaeus1758)	*	
Coleoptera	Scarabeidae Length: 1.9 mm.	 Photo by B. Merheb	*	
		<i>Netocia vidua</i> (Gorg et Percheron)		
Coleoptera	Chrysomellidae Length: 7 mm.	 photo by B. Merheb	*	
Coleoptera	Hydrophilidae	<i>Haccobius syriacus</i> ()Guill	*	

Diptera	Syrphidae Length: 1.5 mm.	 <p>Photo by B. Merheb</p>	medium	common
Diptera	Bombyliidae Length: 5-10 mm.	 <p>Photo by B. Merheb</p>	medium	common
Diptera	Calliphoridae Length: 1 cm.	 <p>photo by B. Merheb</p>	medium	common
Dictioptera	Blattidae Length: 7 mm.	 <p>Photo by B. Merrheb</p>	low	common

Hemiptera	Lygaidae Length: 7 mm.	 <small>Photo by B. Merheb</small>	low	Rare
Hemiptera	Lygaidae	<i>Lygaeus equestris</i> (Linnaeus1758)	*	
Hemiptera	Miridae	<i>Grypocoris</i> ( <i>Turciocoris</i> ) <i>syriacus</i> (Reuter, 1896)	*	
Hemiptera	Miridae	<i>Closterotomus putomi</i> (Horvath, 1888)	*	
Hemiptera	Miridae	<i>Lepidargyrus seidenstueckeri</i> (Wanger1956)	*	
Hemiptera	Miridae	<i>Dereocoris</i> ( <i>Camptobrochis</i> ) <i>serenus</i> (Douglas & Scott,1868 )	*	
Hemiptera	Miridae	<i>Pachyxyhus lineellus</i> (Mulsant & Rey 1852)	*	
Hemiptera	Lygaidae	<i>Lethaeus cribratissimus</i> (Stal,1858)	*	
Hemiptera	Miridae	 <small>photo by B. Merheb</small> <i>Euryopcoris nitidus</i> (Meyer-Dur,1843)	*	
Hemiptera	Scutellaridae	 <small>photo by B. Merheb</small> <i>Graphosoma italium</i> (Mull)	*	



Hemiptera	Scutellaridae	 photo by B. Merheb <i>Graphosoma melanoxanthum</i> (Horvath, 1903)	*	
Hemiptera	Pentatomidae	<i>Raphigaster nebulosa</i> (Poda,1761)	*	
Hemiptera	Pentatomidae	<i>Acrosternum</i> sp	*	
Hemiptera	Coreidae	<i>Camptotus lateralis</i> (Germar,1817)	*	
Hemiptera	Reduviidae	<i>Rhynocoris iracundus</i> (Poda,1761)	*	
Hemiptera	Reduviidae	<i>Sphedanolestes pulchelus</i> (Klug1830)	*	
Hemiptera			*	
Homoptera	Cicadidae	<i>Cercopis intermedia kirschbaum</i>	*	
Hymenoptera	Apidae Length: 1.3 mm	 Photo by B. Merheb	high	common
Hymenoptera	Apidae Length: 1.8 mm	 Photo by B. Merheb	medium	common

Hymenoptera	Apidae Length: 1 cm	 <p>photo by B. Merheb</p>	medium	common
Hymenoptera	Vespidae Length: 1 cm	 <p>photo by B. Merheb</p>	Medium	Common
Hymenoptera	Vespidae Length: 1 cm	 <p>photo by B. Merheb</p>	Medium	Common
Orthoptera	Acrididae Length: 2.5 cm	 <p>Photo by B. Merheb</p>	Low	Rare

Orthoptera	Acrididae Length: 2.0 cm	 <p data-bbox="582 667 758 689">Photo by B. Merheb</p>	low	Rare
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### **A.1.5.6.3 The butterflies**

The determination of the butterflies of Al-Chouf Cedar is the output of a combined effort that was exerted by all members of the team of experts when every time one butterfly is seen, photographed or described it was compared to the content of the plates that are offered by T. Larsen in his book “Butterflies of Lebanon” (1974). The list of the butterflies of Al-Chouf Cedar figures in the Annex 6.



### **A.1.6 Ecological interest of the site**

Al-Chouf Cedar may be considered as unique of its kind in Lebanon and subsequently has a great heritage value. Its biodiversity is of high significance especially that part of its components is of global concern. Ecologically, Al-Chouf Cedar is formed from particular and diversified habitats. Socio-economically, Al-Chouf Cedar has real significance with its water resources and potential significance with eco-tourism.

Its uniqueness derives from the fact that:

-It is the only significant mixed cedar and fir trees forest in the country and that the fir in it is at its southern distribution limit.

-It is extremely diversified over a relatively small area not exceeding 10 square kms.

-Despite its small size, it has offered habitat to 60% of the national breeding avifauna.

-Absolutely, it is the richest area in the country with endemic (more than 50) plant species.

-It is a frequent refuge to threatened species at both national and international levels such as Hyaena, Polecat, Wolf, Corncrake, Black Vulture, Imperial Eagle, etc. which find in the site the necessary elements of their ecological niche.

### **A.1.7 Impact on the site by each exploitation/ production system**

#### **A.1.7.1 Agriculture**

N/A

#### **A.1.7.2 Pasture**

Pasture activity is very seldom practiced in some areas of the site such as above the forested area but practically not within the cedar-fir groves. It is difficult to pretend that there is an overgrazing in the area. Instead, one may suggest that the feet of goats and sheep can less or more crash down the new shoots of the wild rare plant species or can have an effect on the microfauna and on the populations of the land nesting bird species such as larks, pipits, quails, etc. However, the pasture activity can't be qualified as an overgrazing not only because of its limitation in time and space but also because of the weak numbers of livestock involved at Al-Chouf Cedar.

#### **A.1.7.3 Fishing and frogging**

N/A

#### **A.1.7.4 Eco-tourism**

The eco-tourism is presently limited to some birdwatching activities, hicking and few educational visits by students or others, mainly from the surrounding schools. These activities are apparently well guided by the managing authority in collaboration with the local community so that the impact of the visitors on the site is practically very low.

#### **A.1.7.5 Exploitation of the resources**

With the exception of the visitation activity, the remaining activities are relatively of unnoticeable impact on the environment and the biodiversity of this site. In fact:

- the hunting pressure was considerably reduced during the last years as a result of cooperation and understanding between the local community and the managing team. Despite the laws, which ban hunting in a 500 meters belt around reserves, some hunting activities are observed during the

autumn migration seasons on the hills immediately above the forest areas. However, poaching is still occurring and the efforts done to reduce it are active.

- the cutting of wood for combustion is not today exercised within the site and people are satisfied with the illegal collection of dead branches from the reserve's area.

- the collection by individuals of medicinal and other economically wild plant species for personal use is not well controlled at Al-Chouf Cedar and therefore its impact over the site is difficult to assess.

#### A.1.7.6 Industrialization - urbanisation

The only identified urbanization is vestigial and located at the western edges of the site. It consists of few restaurants generating in summer high and abnormal music sound. The ecological integrity of the Al-Chouf Cedar doesn't seem to be affected by these restaurants, which need to be however subjected to an EIA study.

The Al-Chouf Cedar is virtually free from any human agglomeration.

#### A.1.7.7 Water management

N/A

#### A.1. 8 Sensitivity level of the different habitats used by the selected species

HABITAT	KEY SPECIES	SENSITIVITY	THREATS
<i>Pinus brutia</i>	<i>Pinus brutia</i> <i>Orchis romana libanotica</i> <i>Quercus infectoria</i> <i>Juniperus oxycedrus</i> <i>Quercus cerris</i> <i>Malus trilobata</i> <i>Canis lupus pallipe</i> <i>Hyaena hyaena syriaca</i> <i>Mustella nivalis</i> <i>Dryomis nitedula phrygius</i> <i>Sus scrofa lybicus</i> <i>Ciconia ciconia</i> <i>Pernis apivorus</i> <i>Aquila pomarina</i> <i>Accipiter brevipes</i> <i>Falco subbuteo</i> <i>Scolopax rusticola</i> <i>Cuculus canorus</i> <i>Turdus philomelos</i> <i>Turdus iliacus</i> <i>Turdus viscivorus</i> <i>Hippolais languida</i> <i>Corvus corone cornix</i>	Sensitivity index=high  - High specific richness - Diversified micro-habitats - Presence of threatened species - Refuge for certain species	Barbecuing Decreased food availability, Degradation Deliberate killing Destruction by fire Extension of recreational areas Fragmentation Garbage Hunting pesticides Picking Pollution Sensitivity to human disturbance Trapping
<i>Quercus calliprinos</i>	<i>Quercus calliprinos</i> <i>Quercus cerris</i>	Sensitivity index=Medium	- Crushing by cars

	<p><i>Quercus infectoria</i>  <i>Quercus pinnatifida</i>  <i>Rosa dumetorum</i>  <i>Rosa canina</i>  <i>Astragalus sofarensis</i>  <i>Limodorum abortivum</i>  <i>Canis lupus pallipe</i>  <i>Hyaena hyaena syriaca</i>  <i>Mustella nivalis</i>  <i>Dryomis nitedula phrygius</i>  <i>Sus scrofa lybicus</i>  <i>Ciconia ciconia</i>  <i>Pernis apivorus</i>  <i>Aquila pomarina</i>  <i>Accipiter brevipes</i>  <i>Falco subbuteo</i>  <i>Scolopax rusticola</i>  <i>Cuculus canorus</i>  <i>Turdus philomelos</i>  <i>Turdus iliacus</i>  <i>Turdus viscivorus</i>  <i>Hippolais languida</i>  <i>Corvus corone cornix</i></p>	<p>- High specific richness  - Vital habitats for the survival of hygrophilic species  - Presence of threatened species  - Refuge for certain species</p>	<p>Decreased food availability  Deliberate hunting and trapping  Persecution by man  Barbacuing  Degradation  Destruction by fire  Fragmentation  Garbage  organic pollution  Hunting  Persecution  Plucking  Pollution and pesticides  Sensitivity to human disturbance  Trapping  Water overexploitation</p>
<p><i>Cedrus libani</i>  &amp;  <i>Abies cilicica</i></p>	<p><i>Cedrus libani</i>  <i>Acer tauricum</i>  <i>Juniperus oxycedrus</i>  <i>Prangos asperula</i>  <i>Abies cilicica</i>  <i>Quercus cedrorum</i>  <i>Phlomis brevilabris</i>  <i>Coronilla varia libanotica</i>  <i>Quercus pinnatifida</i>  <i>Juniperus excelsa</i>  <i>Sorbus flabellifolia</i>  <i>Hedera helix</i>  <i>Astragalus ehdenensis</i>  <i>Canis lupus pallipe</i>  <i>Hyaena hyaena syriaca</i>  <i>Mustella nivalis</i>  <i>Dryomis nitedula phrygius</i>  <i>Sus scrofa lybicus</i>  <i>Ciconia ciconia</i>  <i>Pernis apivorus</i>  <i>Aquila pomarina</i>  <i>Accipiter brevipes</i>  <i>Falco subbuteo</i></p>	<p>Sensitivity index=very high  - Presence of threatened or rare species  - Refuge for certain species</p>	<p>Decreased food availability  Deliberate killings  Habitat destruction  Pollution and pesticides  Sensitivity to human disturbance  Barbecuing  Degradation  Destruction by feet of hunters  Destruction by fire  Fragmentation  Garbage  Grazing  Hunting  Plant collection  Trapping</p>

	<i>Parus coeruleus</i> <i>Scolopax rusticola</i> <i>Cuculus canorus</i> <i>Turdus philomelos</i> <i>Turdus iliacus</i> <i>Turdus viscivorus</i> <i>Hippolais languida</i> <i>Corvus corone cornix</i> - <i>Lacerta media</i> <i>wolterstorffi</i> - <i>Laudakia stellio stellio</i>		
Barren areas Glades Forest edges	<i>Prunus ursina</i> <i>Sambucus ebulus</i> <i>Acantholimon libanoticum</i> <i>Berberis libanotica</i> <i>Astragalus gummifer</i> <i>Juniperus excelsa</i> <i>Juniperus oxycedrus</i> <i>Rosa glutinosa</i> <i>Dianthus karami</i> <i>Viola libanotica</i> <i>Erinaceus europaeus</i> <i>concolor</i> <i>Canis lupus pallipe</i> <i>Hyaena hyaena syriaca</i> <i>Tadarida teniotis</i> <i>Myotis blythi omari</i> <i>Pipistrellus kuhli</i> <i>ikhawanius</i> <i>Buteo rufinus</i> <i>Hieraaetus fasciatus</i> <i>Falco subbuteo</i> <i>Coturnix coturnix</i> <i>Parus coeruleus</i> <i>Crex crex</i> <i>Alectoris chukar</i> <i>Cuculus canorus</i> <i>Bubo bubo</i> <i>Eremophila alpestris</i> <i>Oenanthe finschii</i> <i>Hippolais languida</i> <i>Serinus syriacus</i> <i>Carduelis cannabina</i> <i>Corvus cornix</i> - <i>Salamandra</i>		Barbecuing Degradation Destruction by feet of hunters Destruction by fire Fire Fragmentation Garbage Grazing Hunting Plucking Pollution

	<i>infraimmaculata</i> <i>infraimmacula</i> - <i>Testudo graeca terrestris</i> - <i>Chameleo chameleon restricta</i> - <i>Cyrtopodion kotschy orientalis</i> - <i>Hierophis jugularis</i> - <i>Malpolon monspessulanus insignitus</i> - <i>Platiceps najadum dahlii</i> - <i>Vipera bornmuelleri</i>		
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### **A.1.9 Constraints and opportunities for the conservation**

#### **A.1.9.1 Main constraints**

- The area is heavily inspected during the summer week-ends by hunters and picnickers.
- The extension of the recreational area is likely to happen on the basis of more used forest edges, affecting as such the integrity of the ecosystems.
- There is lack of awareness, especially on the importance of conservation and value of endemic or threatened species..

#### **A.1.9.2 Main opportunities**

- Highly desired area for eco-tourism and education
- Highly desired area for biological studies
- Quasi absence of inhabitants or workers.
- Inexistent polluting industrial activities.
- Hunting activity is negligible.
- High potentiality for resource-generating activities.

### **A.1.10 Socio-economic impacts of taken measures**

#### **A.1.10.1 Economically**

- Investment in the field of eco-tourism (birdwatching, fauna observing, hiking, tour-guiding, etc.).
- Investment in banking with genetic resources and wild relative plants.
- Investment in biological and natural education
- Investment in new alternatives

#### **A.1.10.2 Socially**

- Deprive locals from free access rights
- Deprive shepherders from pasture areas
- Provide locals with work opportunities

### **A.1.11 Proposed conservation management actions**

#### **A.1.11.1 Short term**

##### **A.1.11.1.1 Protection:**

- Put in place a responsible and wise use measures in the site;
- Protect the economic plants from over-exploitation;
- Prohibit the access of excursionists to fragile spots;
- Stop any additional restaurant activities, especially in the Joueit area;
- Limit and canalize the access to the sensitive places of the site.
- Ban the hunting within a 500m belt around the site even during the hunting season.

- Stop the plant picking activities.
- Stop unregulated and regulated activities from generating garbage in the area.
- Keep the site clean from solid waste and other garbage.
- Ban illegal taking and poaching.

#### **A.1.11.1.2 Rehabilitation**

- Link the management of the site with that of the surrounding environ as an integral conservation action, especially that some mammals and many birds of Al-Chouf Cedar use the whole area for breeding or refuging and resting or roosting.

#### **A.1.11.1.3 Valorisation/ Added value**

- Create a center of information on the main place of Ehden to attract passing people.
- Create a package of activities to include several areas.
- Create eco-touristic activities that may generate incomes for the local community.

#### **A.1.11.2 Mid term**

##### **A.1.11.2.1 Protection:**

- Sensitise visitors and local communities
- Regulate pastoral activities.
- Rationalize the exploitation of natural resources.
- Control the commercialization of threatened species and their product thereof.

##### **A.1.11.2.2 Rehabilitation**

- Maintain the diversity of the habitat through conservation of wilderness and scenic landscape and avoidance of alien or exotic species introduction.

##### **A.1.11.2.3 Valorisation/ Added value:**

- Establish an eco-museum on the biodiversity of the site.
- Valorise the site for biological study purposes
- Valorise the site for educational purposes
- Valorise the site for ecotourism purposes (Hides for observation, Footpath and equestrian path) through local community management.

#### **A.1.12 Zonation of the space**

##### **A.1.12.1 Strictly protected zones**

- . The core areas of each of the four habitats identified.
- . The heavy slopes (soil erosion avoidance)
- . The glades.

##### **A.1.12.2 Zones with limited access**

- . All zones outside existing trails.
- . The Fir-Cedar Habitat

##### **A.1.12.3 Zones with free access**

- . The trails (unpaved tracks).

#### **A.1.13 Site-specific strategies and indicators for monitoring**

##### **A.1.13.1 Site-specific strategies**

The technology that is used in biodiversity monitoring varies from plants to animals and from animal species to another. Accordingly we propose a strategy for monitoring based on a medium monitoring program, which provides the technology to be used in the Al-Chouf Cedar.

The table below summarizes the strategic steps that are to be taken in a logical framework:

Issue/ General question	Fragmentation of habitats, degradation of forest, alteration of wilderness, garbage, pollution. Consequences: loss of habitats, loss of natural resources, reduction of feeding, breeding, resting areas, disturbance and poaching
Issue/ Specific question	Decrease in number of the species individuals, including the selected species.
Objectives	Follow up the variation in numbers, especially for the selected species
Hypothesis	With improved situation and favorable conditions, the affected species will increase in number and the selected threatened or rare species could find shelter and security in the site.
Methods	Seasonal recording Regular monitoring and study of behavior during the flowering, wintering, breeding seasons, etc.
Feasibility	The necessity to train people on monitoring activities
Pilot study	Use the present study as study/reference. It could be handled to members of the management team to insure monitoring sustainability
Sampling	Count species and individual on trimestrial basis and increase the effort of observation during breeding/multiplication season.
Sample analysis	Elaborate matrix to express results Project data (species/ individuals) on maps of habitats.
Report preparation	Analyze data at the end of each annual cycle and compare them with previous data (study/reference). Discuss the reasons of variations in relation to different parameters (mainly management measures).
Management actions and project evaluation	Evaluate the outputs of monitoring and formulate appropriate conservation measures

#### A.1.13.2 Ecological monitoring - Indicators

Target group for monitoring	Key elements	Indicators	Method	Means
Mammals	<i>Canis lupus pallipe</i> <i>Hyaena hyaena syriaca</i> <i>Mustella nivalis</i> <i>Dryomys nitedula phrygius</i> <i>Sus scrofa lybicus</i> <i>Erinaceus europaeus concolor</i>	<ul style="list-style-type: none"> <li>• Population size</li> <li>• Area of the available appropriate habitat</li> <li>• Size of the</li> </ul>	<ul style="list-style-type: none"> <li>- Trimestrial surveys</li> <li>- These mammals are mainly nocturnal and therefore difficult to see. However,</li> </ul>	<ul style="list-style-type: none"> <li>. Binoculars are very helpful. They allow you to watch from a distance, without disturbing the animals.</li> <li>. Use a torch, if</li> </ul>

	<p><i>Tadarida teniotis</i>  <i>Myotis blythi omari</i>  <i>Pipistrellus kuhli</i>  <i>ikhawanius</i></p>	<p>specific ecological niche available</p> <ul style="list-style-type: none"> <li>• Number of burrows</li> <li>• Habitats occupied by each species</li> <li>• Species movement</li> <li>• Distribution areas</li> </ul>	<p>the best time to see them is in the early morning or at dusk where they often feed in the open at dawn and retire to the cover of woodland when it becomes warm or when human activity increases. Looking for droppings will often show the best places to watch, and there are many other signs of animal presence such as remains of eaten prey and tracks left in mud and perhaps snow. Remember that most mammals, have very sensitive noses-choose a spot down-wind from the place where you expect to see them. During dawn watch you may also be lucky enough to see one of the more strictly nocturnal animals getting home late, perhaps a wolf or a wild cat. This goes equally for the more elusive carnivores, like otter. The small rodents like the Levant vole are particularly</p>	<p>possible with a red glass.</p> <ul style="list-style-type: none"> <li>. 4x4 vehicle</li> <li>. Night camera</li> <li>. Mammal traps</li> <li>.Light projector</li> </ul>
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			<p>difficult to see. Many come out only at night but even the diurnal ones generally stick to dense cover. However, they can sometimes be seen at night by regularly putting down bait, such as seeds of any kind, at a suitable spot. Voles can sometimes be found under logs (which should always be carefully replaced).</p> <ul style="list-style-type: none"> <li>- Questioning of villagers and shepherders, etc.</li> </ul>	
Birds	<p><i>Ciconia ciconia</i>  <i>Pernis apivorus</i>  <i>Aquila pomarina</i>  <i>Accipiter brevipes</i>  <i>Falco subbuteo</i>  <i>Scolopax rusticola</i>  <i>Cuculus canorus</i>  <i>Turdus philomelos</i>  <i>Turdus iliacus</i>  <i>Turdus viscivorus</i>  <i>Hippolais languida</i>  <i>Corvus cornix</i>  <i>Parus coeruleus</i>  <i>Buteo rufinus</i>  <i>Hieraetus fasciatus</i>  <i>Falco subbuteo</i>  <i>Coturnix coturnix</i>  <i>Parus coeruleus</i>  <i>Crex crex</i>  <i>Alectoris chukar</i>  <i>Cuculus canorus</i></p>	<ul style="list-style-type: none"> <li>- Diversity index</li> <li>- Number of nesting couples</li> <li>- Size of populations</li> <li>- Number of wintering individuals</li> <li>- Number of passing birds</li> <li>- Frequency of roosting birds</li> <li>- Distribution per habitat</li> <li>- Sectorial geographic distribution</li> </ul>	<ul style="list-style-type: none"> <li>- Surveys every 15 days mainly from March to May.</li> <li>- To monitor birds there are several techniques which differ with the species and habitats. But certain techniques are necessary to achieve success. Birds are most active in the morning and evening, and may rest or shelter from the heat of the sun during the day. The</li> </ul>	<ul style="list-style-type: none"> <li>- Binoculars 10x50 or 7x48</li> <li>- Telescope 20-60 x 80</li> <li>- Note book</li> <li>- Tape recorder</li> <li>- 4x4 vehicle</li> <li>- Camera.</li> <li>- Field guide book</li> </ul>

	<p><i>Bubo bubo</i>  <i>Eremophila alpestris</i>  <i>Oenanthe finschii</i>  <i>Hippolais languida</i>  <i>Serinus syriacus</i>  <i>Carduelis cannabina</i></p>	<p>- Density</p>	<p>most rewarding times to see them are therefore from sunrise until 10 AM and again after 3 PM; and in order to see some marshy or rare birds one needs to remain until dusk. Raptors and other soaring birds become active usually after 10 AM. This is due to the fact that they are dependent on ascending air which helps them to soar and economize energy during their flight. To avoid alarming the birds, it is essential to approach slowly and silently, avoiding any sudden movement. If one is on foot, a slow walk round a likely bird spot may reveal all but the most secretive species. In case of more than one observer, one person may advance while others observe. Birds should not be alerted to the observer's presence at all. One may use a</p>	
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			car which can make a most useful mobile hide, as birds may accept the arrival of a car if the passengers remain still and do not open and slam the doors.	
Herpetofauna	<ul style="list-style-type: none"> <li>-<i>Lacerta media wolterstorffi</i></li> <li>-<i>Laudakia stellio stellio</i></li> <li>-<i>Salamandra inframaculata</i></li> <li>-<i>Testudo graeca terrestris</i></li> <li>-<i>Chameleo chameleon restricta</i></li> <li>-<i>Cyrtopodion kotschyi orientalis</i></li> <li>-<i>Hierophis jugularis</i></li> <li>-<i>Malpolon monspessulanus insignitus</i></li> <li>-<i>Platiceps najadum dahlü</i></li> <li>-<i>Vipera bornmuelleri</i></li> </ul>	<ul style="list-style-type: none"> <li>- Density of populations</li> <li>- Evolution of numbers</li> <li>- Species localization</li> <li>- Number of individuals</li> <li>- Density of populations</li> <li>- Distribution of species</li> </ul>	<ul style="list-style-type: none"> <li>- 4 spring census</li> <li>- 4 summer census</li> <li>- 4 autumn census</li> </ul> <p>- Few traces are left by reptiles, through the few that can be found are useful indicators, such as cast or 'sloughed' snake skins. Lizards often lie out on the same stone each day when basking in the sun. Such a stone is likely to be covered with their droppings. These are easily mistaken for bird droppings, being dark at one end and whitish at the other. There is every chance that they will be found in the same place, or within a meter or so, on successive day. However, there are exceptions to this. Some reptiles, for</p>	<ul style="list-style-type: none"> <li>- Binocular 8x40</li> <li>- Broad beamed lamp</li> <li>- Soft forceps</li> <li>- 4x4 vehicle</li> <li>- ¼ litre glass jars</li> <li>- vinegar</li> <li>- net "fauchoir"</li> </ul>

			<p>example, tends to shift their quarters after mating, frequently by a kilometer or so, but come spring and it will be found back at the previous year's courtship ground.</p> <p>In general, reptiles and amphibians are much easier to approach than most mammals and it is often possible to get near enough to examine them in detail. Most species usually sleep through the winter but the spring, when they come out of hiding and begin courtship, is a good time to look for them. In the summer they become more retiring and more difficult to find. Early morning searches are most productive for seeing species that are regularly active by day but searching with a broad-beamed lamp: rainy evenings are best for this. At spring time, especially frogs and toads can be located by their voices. Each</p>	
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			<p>species has its own distinctive call, ranging from the echoing croak to the soft, mournful piping. The continuous rustling of a tortoise ploughing through dense herbage can soon be recognized as different from the intermittent scrabbling of a foraging lizard.</p> <p>Because they can be approached closely, it is tempting to try to catch reptiles and amphibians but they are delicate animals and even slight damage may seriously reduce their chances of survival. A lizard will shed its tail if grasped by it and, although the animal can grow a new one, it will be at a serious disadvantage while doing so, especially since the process requires a great deal of protein. If handling cannot be avoided it should be done with great care and amphibians should be held only with wet hands to protect</p>	
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			<p>their soft, usually moist skins. It goes without saying that venomous snakes should not be handled in any circumstances.</p> <p>Monitoring with the quadrat method or surveying at night are two rewarding methods implicating the search under stones and the use of traps.</p>	
Entomological groups	<p>Scarabeidae Carabidae Staphylinidae Tenebrionidae Tipulidae Pentatomidae Pyrrhocoridae Acrididae Gryllidae Tetrigidae Meloidae Cantharidae Oedemeridae</p>	<p>- Diversity of taxonomic groups - Density of populations - Abundance and larva quality</p>	<p>- Three sampling per year: Spring/Summer and Autumn Use of Barber traps in different habitats.</p> <p>Threshing or beating branches of trees and shrubs to collect insects underneath.</p> <p>Mowing of herbaceous layer.</p> <p>Surveys on monthly basis from March to June and in the beginning of November.</p>	<p>- 4x4 vehicle - Soft forceps - Insect aspirator - ¼ liter glass jars. - Net fauchoir</p>
Flora	<p><i>Abies cilicica</i> <i>Acantholimon libanoticum</i> <i>Acer tauricum</i> <i>Astragalus ehdenensis</i> <i>Astragalus gummifer</i> <i>Astragalus sofarensis</i> <i>Berberis libanotica</i></p>	<p>- Study of dynamic of change - Locality of the species - Distribution of the species - Density</p>	<p>Transect method involving 4 seasonal missions per year or trimestrial inspection all</p>	<p>4x4 vehicle GPS Topographic map Aerial photo Digital camera</p>

	<i>Cedrus libani</i> <i>Coronilla varia libanotica</i> <i>Dianthus karami</i> <i>Hedera helix</i> <i>Juniperus excelsa</i> <i>Juniperus oxycedrus</i> <i>Limodorum abortivum</i> <i>Malus trilobata</i> <i>Orchis romana libanotica</i> <i>Phlomis brevilabris</i> <i>Pinus brutia</i> <i>Prangos asperula</i> <i>Prunus ursina</i> <i>Quercus calliprinos</i> <i>Quercus cedrorum</i> <i>Quercus cerris</i> <i>Quercus infectoria</i> <i>Quercus pinnatifida</i> <i>Rosa canina</i> <i>Rosa dumetorum</i> <i>Rosa glutinosa</i> <i>Sambucus ebulus</i> <i>Sorbus flabellifolia</i> <i>Viola libanotica</i>	- Density of the vegetal community - Occupied area - Cover% - Stratification	year round	
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#### A.1.13.3 Socio-economic monitoring- Indicators

Nature of monitoring	Key elements	Indicators	Method	Means
	Grazing activity	# of heads/ type Period and degree of grazing # of birth given/ year	Questionnaire Interview	Vehicle
	Eco-ouristic activity	# of visitors/month # of locals involved in eco-tourism and recreation Quantity of waste left by visitors/ day Degree of satisfaction for the local community	Questionnaire Interview	Vehicle

#### A.1.14 Favorable and unfavorable elements to biodiversity

Favorable elements to biodiversity	Unfavorable elements to biodiversity
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<p><b>Vegetal biodiversity</b></p> <ul style="list-style-type: none"> <li>• Endemic 62</li> <li>• Rare 13</li> <li>• Threatened 21</li> <li>• Notworthy 75</li> <li>• Biotopes 4</li> </ul> <p><b>Animal biodiversity</b></p> <ul style="list-style-type: none"> <li>• Endemic 2 (reptiles)</li> <li>• Rare 103</li> <li>• Threatened 23</li> <li>• Notworthy 37</li> <li>• Biocenosis 6</li> </ul>	<p>Collection</p> <p>Grazing</p> <p>Fire</p> <p>Loss of wilderness</p> <p>Habitat transformation</p> <p>Lack of infrastructure allowing local community participatory approach</p> <p>Lack of job in domains other than the exploitation of natural resources</p> <p>Frequentation</p> <p>Fire</p> <p>Pollution</p> <p>Poaching</p> <p>Hunting</p>
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### A.1.15 Identified Environmental values

Value	Asset	Limiting factors
High rate of threatened species	<ul style="list-style-type: none"> <li>• Very weak urbanism</li> <li>• Willigness of local community for protection</li> </ul>	<ul style="list-style-type: none"> <li>• High frequentation by poachers</li> <li>• Fire</li> <li>• Ppllution</li> </ul>
Exceptional eco-tourism potentiality	<ul style="list-style-type: none"> <li>• Location of site along an important flyway</li> <li>• Hotspot site</li> <li>• Unique remnant landscape</li> </ul>	<ul style="list-style-type: none"> <li>• Hunting</li> <li>• Poaching</li> <li>• Pollution</li> <li>• Fire</li> </ul>

### A.1.16 Management measures and threat/ hazard mitigation

Target	Management measures/ threat mitigation
<p><b>Phyto-ecology</b></p> <ul style="list-style-type: none"> <li>- Protect the economically important wild plant species (medicinal, aromatic, culinary, wild relatives, etc.</li> <li>- Protect the unique association Fir-Cedar</li> <li>- Protect the heavy slopes from erosion</li> </ul>	<p><b>Management actions</b></p> <p><b>Protection</b></p> <ul style="list-style-type: none"> <li>- Raise awareness of visitors</li> <li>- Reduce poaching</li> <li>- Regulate pasture</li> <li>- Regulate dead wood collecting</li> <li>- Update the law of the reserve</li> </ul> <p><b>Rehabilitation</b></p> <ul style="list-style-type: none"> <li>- Protect seedlings from pedestrians</li> </ul>



<ul style="list-style-type: none"> <li>- Protect the edges of the forest from urban encroachment (restaurants).</li> </ul>	<p><b>Valorisation</b></p> <ul style="list-style-type: none"> <li>- Promote eco-tourism through improved access to micro hotspots, managed recreational zones, equestrian surveillance patrols, and development of trails for pedestrians, etc.</li> <li>- Create neighboring or bordering areas as alternative places for camping and barbecuing.</li> </ul>
<p><i>Entomofauna</i></p>	<p><b>Management actions</b></p> <p><b>Protection</b></p> <ul style="list-style-type: none"> <li>- Raise awareness of visitors</li> <li>- Protect from collectors</li> </ul> <p><b>Rehabilitation</b></p> <ul style="list-style-type: none"> <li>- Stop generating solid waste on the site</li> </ul> <p><b>Valorisation</b></p> <ul style="list-style-type: none"> <li>- Promote eco-tourism through improved access to micro hotspots, managed recreational zones, equestrian surveillance patrols, development of trails for pedestrians, etc.</li> <li>- Create neighboring or bordering areas as alternative places for camping and barbecuing.</li> </ul>
<p><i>Herpetofauna</i></p>	<p><b>Management actions</b></p> <p><b>Protection</b></p> <ul style="list-style-type: none"> <li>- Raise awareness of visitors</li> <li>- Reduce poaching</li> <li>- Regulate pasture</li> <li>- Protect the association fir-cedar</li> <li>- Protect the forest edges mainly for integrity of ecosystems</li> <li>- Update the law of the reserve</li> </ul> <p><b>Rehabilitation</b></p> <ul style="list-style-type: none"> <li>- Keep the forest clean from visitor's garbage</li> </ul> <p><b>Valorisation</b></p> <ul style="list-style-type: none"> <li>- Promote eco-tourism through improved access to micro hotspots, managed recreational zones,</li> </ul>

	<p>equestrian surveillance patrols, development of trails for pedestrians, etc.</p> <ul style="list-style-type: none"> <li>- Create neighboring or bordering areas as alternative places for camping and barbecuing.</li> </ul>
<i>Avifauna</i>	<p><b>Management actions</b></p> <p><b>Protection</b></p> <ul style="list-style-type: none"> <li>- Raise awareness of visitors</li> <li>- Reduce poaching and illegal taking</li> <li>- Regulate or canalize grazing</li> <li>- Based on the fact that Al-Chouf Cedar is already declared protected area, impose when necessary a wise use of resources and protection of threatened species.</li> <li>- Ban hunting activities within the Al-Chouf Cedar area and in a belt of 500 meters around the site.</li> </ul> <p><b>Rehabilitation</b></p> <p><b>Valorisation</b></p> <ul style="list-style-type: none"> <li>- Promote eco-tourism through improved access to micro hotspots, managed recreational zones, equestrian surveillance patrols, development of trails for pedestrians;</li> <li>- Create neighboring or bordering areas as alternative places for camping and barbecuing;</li> <li>- Build a Birdwatching tower or birdwatching hides</li> </ul>
<i>Mammals</i>	<p><b>Management actions</b></p> <p><b>Protection</b></p> <ul style="list-style-type: none"> <li>- Raise awareness of visitors</li> <li>- Reduce poaching and illegal taking</li> <li>- Regulate or canalize grazing</li> <li>- Based on the fact that Al-Chouf Cedar is already declared protected area, impose when necessary a wise use of resources and protection of threatened species.</li> <li>- Ban hunting activities within the</li> </ul>

	<p>Al-Chouf Cedar area and in a belt of 500 meters around the site.</p> <p><b>Rehabilitation</b></p> <p><b>Valorisation</b></p> <ul style="list-style-type: none"> <li>- Promote eco-tourism through improved access to micro hotspots, managed recreational zones, equestrian surveillance patrols, development of trails for pedestrians;</li> <li>- Create small patches of bushy areas to facilitate a safe mammal movement;</li> <li>- Create neighboring or bordering areas as alternative places for camping and barbecuing;</li> <li>- Build an elevated hide to watch nocturnal mammal species</li> </ul>
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## **A.1.17 Needs for Complementary studies**

### **A.1.17.1 Ecological studies**

- Monitor the dynamism of the different vegetal communities.
- Localization, estimation of numbers and dynamism of *Hyaena hyaena*, *Canis lepus*, *Testudo graeca* and *Chamaeleo chamaeleon* populations.
- The relation between the vegetal stratification and bird breeding success.
- The size and distribution of the Jay within the site.
- The impact of the visitors on the ground bird breeding species.
- The present phenological distribution of some bird species within the site such as Blue Tit, Blue Thrush, Syrian Serin, etc.
- Study of the Wolves population and dynamism.
- Phenological monitoring of habitats and animal communities.
- Micro-distribution of snake species
- Study of the entomofauna and its role within the trophic chain of the site.

### **A.1.17.2 Socio-economic studies**

- Socio-economic impact of the proposed conservation measures.
- The impact of wildboars on the agriculture exploitation.
- The impact of hunters on the threatened species and the awareness level of the local population.
- The hydrology of the hydrographic web in the area for wise and sustainable use purposes.

## ANNEXES

**ANNEX 1: (Table 1):** List of plants of Al-Chouf Cedar Reserve. Arabic names are mainly extracted from the "Dictionnaire étymologique de la flore du Liban" (Nehmé, 2000).

- (1) refers to nationally threatened species  
 (2) refers to endemic species  
 (3) refers to nationally rare species  
 (4) refers to wholly or partially restricted species to East Mediterranean area.

Pinaceae	Pinaceae	مخروطيات
<i>Cedrus libani</i> (4)	Cedar of Lebanon	أرز لبنان
<b>Cupressaceae</b>	<b>Cupressaceae</b>	<b>سرويات</b>
<i>Arceuthos drupacea</i> (1) (4)	Drupe-bearing arceuthos	دفران نووي
<i>Juniperus oxycedrus</i>	Prickly juniper	دفران
<i>Juniperus excelsa</i> (4)	Grucian juniper	لزاب
<b>POACEAE (GRAMINEAE)</b>	<b>Gramineae</b>	<b>نجليات</b>
<i>Aegilops ovata</i>	Ovate goat-grass	شعير ابليس
<i>Agropyron libanoticum</i> (2)	Lebanon couch-grass	سيفون لبناني
<i>Agropyron panormitanum</i>	Palermo couch-grass	سيفون بالرمو
<i>Alopecurus anthoxanthoides</i> (4)	Reed fox-tail	ثعلبيه قصبية
<i>Arrhenatherum elatius</i> (1) (3)	Tall false-oat	ارينثارم عال
<i>Arrhenatherum kotschyi</i> (1) (3) (4)	Kotschy's false-oat	ارينثارم كتشي
<i>Arrhenatherum palaestinum</i> (4)	Palestine false-oat	ارينثارم فلسطيني
<i>Briza maxima</i>	Great quaking-grass	قفة الشيخ
<i>Bromus japonicum</i> (3)	Japanese brome	ثرغول ياباني
<i>Bromus tectorum</i>	Wall brome	ثرغول السطوح
<i>Bromus tomentellus</i> (4)	Woolly brome	ثرغول ليبيدي
<i>Corynphorus deschampsoides</i> (2)	Deschampsia club-grass	خرطالبيه كاذبه
<i>Cynosurus coloratus</i>	Colored dog's-tail	ساهر ملون
<i>Dactylis glomerata hispanica</i>	Orchad-grass	اصبعيه متجمعه
<i>Eragrostis pilosa</i> (1) (3)	Hairy love-grass	عنزع وبر
<i>Gastridium ventricosum</i>	Yellow-spiked millet	سبيله بطنه
<i>Heleochloa acutiglumis</i> (2)	Sharp-glumed heleochloa	بقق حاد العصفات
<i>Heteranthelium piliferum</i> (4)	Hairy heteranthelium	هترنتليوم وبر
<i>Hyparrhenia hirta</i> (1)	Shaggy hyparrhenia	صخبر ازب
<i>Melica ciliata laxiflora</i> (1)	Ciliate melick	مليقه مهدبه
<i>Melica inaequiglumis</i> (1) (3)	Unequal-glumed melick	مليقه متباينه العصفات
<i>Milium pedicellare</i> (4)	Pedicellare millet	طهف رجيلي
<i>Milium trichopodum</i> (4)	Capillary-culmed millet	طهف شعري السوق

<i>Oryzopsis holciformis blanchiana</i> (4)	Large-flowered mountain-rice	ارزیه هلقوسیه
<i>Oryzopsis miliacea</i>	Millet mountain-rice	مکنسه بریه
<i>Phalaris brachystachys</i>	Short-spiked Canary-grass	بشته قصیره السنبله
<i>Phalaris bulbosa</i>	Bulbous Canary-grass	بشته بصلیه
<i>Phleum montanum</i> (4)	Mountain timothy	عصویه جبلیه
<i>Phleum nodosum</i>	Knotted timothy	عصویه عقدا
<i>Pilgerochloa blanchi</i> (1) (2)	Blanche's pilgerochloa	بلجریه بلانش
<i>Poa diversifolia</i> (4)	Diversely-leaved meadow-grass	تف مختلف الورق
<i>Poa persica</i>	Persian meadow-grass	تف المروج
<i>Poa silvicola</i>	Forest meadow-grass	تف بصلی
<i>Stipa barbata</i> (1)	Bearded feather-grass	حلفاء ملتحيه
<i>Stipa bromoides</i>	Brome feather-grass	حلفاء ثرغولیه
<i>Taeniatherum crinitum</i> (4)	Long-haired taeniatherum	تینیاثروم طویل الشعر
<i>Themeda trianda syriaca</i> (4)	Three-stamened themeda	ثمد ثلاثی الاسديه
<i>Trisetaria flavescens</i>	Yellow-oat	عیده
<b>CYPERACEAE</b>	<b>Cyperaceae</b>	<b>سعدیات</b>
<i>Blysmus compressus</i>	Compressed blymus	نبعیه مضغوطه
<i>Carex divisa</i>	Bracteata marsh-sedge	سعدی
<i>Carex flacca</i>	Glaucus sedge	سعدی مترهل
<i>Carex stenophylla</i>	Narrow-leaved sedge	سعدی ضیق الورق
<i>Cyperus flavescens</i>	Yellowish cyperus	سعد مصفر
<i>Scirpus holoschoenus</i>	Cluster-headed club-rush	دیس اسلی
<b>JUNCACEAE</b>	<b>Juncaceae</b>	<b>اسلیات</b>
<i>Juncus capitatus</i>	Headed rush	أسل
<b>LILIACEAE</b>	<b>Liliaceae</b>	<b>زنبقیات</b>
<i>Allium affine</i> (4)	Related garlic	ثوم مشابه
<i>Allium arvense</i>	Field garlic	ثوم الأقرع
<i>Allium feinbergii</i> (2)	Feinberg's garlic	ثوم فینبرغ
<i>Allium libani</i> (2)	Lebanon garlic	ثوم جبلی
<i>Allium rotundum</i>	Round garlic	ثوم مدور
<i>Allium rupicolum</i> (3) (4)	Rock garlic	ثوم الصخور
<i>Allium staminium</i> (4)	Long-stamened garlic	ثوم طویل الأسديه
<i>Allium trifoliatum</i>	Three-leaved garlic	ثوم ثلاثی الورق

<b>Asphodeline brevicaulis drusorum (4)</b>	Short-stemmed asphodeline	عطعاط قصير الساق
<i>Asphodelus microcarpus</i>	Common asphodel	بروق صغير الثمر
<i>Bellevalia flexuosa</i> (4)	Flexuous bellevalia	بلفالية ملتوية
<i>Bellevalia hermonis</i> (2)	Hermon bellevalia	بلفليه حرمون
<i>Bellevalia macrobotrys</i> (4)	Large-clustered bellevalia	بلفليه كبيره العنقود
<i>Colchicum brachyphyllum</i> (4)	Short-leaved meadow-saffron	سورنجان قصير الورق
<i>Colchicum hierosolymitanus</i> (4)	Jerusalem meadow-saffron	سورنجان القدس
<i>Fritillaria crassifolia</i> (1)	Thick-leaved fritillary	ذنبان
<i>Fritillaria libanotica</i>	Lebanon fritillary	عرار
<i>Gagea anisanthos</i> (4)	Unequal-flowered gagea	غاجيه متباينه الزهر
<i>Gagea micrantha</i> (2)	Small-flowered gagea	غاجية محلقة
<i>Gagea peduncularis</i> (4)	Peduncled gagea	غاجية مزنده
<i>Gagea reticulata</i>	Netted gagea	شحوم
<i>Hyacinthus orientalis</i> (4)	Oriental hyacinth	خزام شرقي
<i>Muscari commutatum</i>	Dark grape-hyacinth	حلحل مغير
<i>Muscari neglectum</i>	Neglected grape-hyacinth	حلحل مهمل
<i>Muscari racemosum</i>	Clustered grape-hyacinth	حلحل عنقودي
<i>Ornithogalum billardieri</i> (4)	Billardiere's star-of-Bethlehem	صاصل
<i>Ornithogalum neurostegium</i> (4)	Nerved-covered star-of-Bethlehem	صاصل معرق الغطاء
<b>Puschkinia scilloides libanotica (2)</b>	Lebanese striped squill	بشكنية لبنان
<i>Tulipa lownei</i> (2)	Lowne's tulip	توليب لوني
<i>Tulipa aucheriana westii</i> (2)	Aucher's tulip	توليب وست
<i>Tulipa montana</i> (4)	Mountain tulip	توليب الجبل
<b>AMARYLLIDACEAE</b>	<b>Amaryllidaceae</b>	<b>نرجسيات</b>
<i>Ixiolirion tataricum</i>	Mountain lily	زنبق تترى
<i>Sternbergia clusiana</i> (4)	Clusius' sternbergia	سترنبرجيا كلوزيوس
<b>IRIDACEAE</b>	<b>Iridaceae</b>	<b>سوسنديات</b>
<i>Iris histrio</i> (4)	Histrio iris	مكحلة الغولة
<i>Romulea nivalis</i> (2)	Snow romulea	رومولية الثلوج
<b>ORCHIDACEAE</b>	<b>Orchidaceae</b>	<b>سحلبيات</b>
<i>Anacamptis pyramidalis</i> (1)	Pyramidal orchid	سحلب هرمي
<i>Cephalanthera longifolia</i> (1)	Long-leaved hellaborine	سفلنترة طويلة الورق
<i>Epipactis consimilis</i> (1) (4)	Similar epipactis	ايببكتيس مماثل

<i>Himantoglossum affine</i> (1) (3) (4)	Related lizard-orchid	هيمنتغلسوم مشابه
<i>Ophris fuciflora</i> (1)	Drone ophris	حاجبية زنبور
<i>Orchis anatolica</i> (1) (4)	Anatolian orchid	سحلب الأناضول
<i>Orchis coriophora fragrans</i>	Bug orchid	سحلب بقي
<i>Orchis holocheilos</i>	Entire-lipped orchid	سحلب الشفيفة
<i>Orchis iberica</i>	Iberian orchid	سحلب إيبيريا
<i>Orchis romana libanotica</i> (1) (2)	Lebanon orchid	سحلب لبناني
<i>Orchis tridentata</i> (1)	Three-toothed orchid	سحلب ثلاثي الأسنان
<b>SALICACEAE</b>	<b>Salicaceae</b>	<b>صفصافيات</b>
<i>Salix libani</i> (4)	Lebanon willow	صفصاف لبنان
<b>BETULACEAE</b>	<b>Betulaceae</b>	<b>بتوليات</b>
<i>Alnus orientalis</i> (4)	Oriental alder	نغث شرقي
<b>FAGACEAE</b>	<b>Fagaceae</b>	<b>بلوطيات</b>
<i>Quercus brantii look</i> (4)	Brant's oak	بلوط برانت
<i>Quercus calliprinos</i>	Kermes oak	سنديان
<i>Quercus infectoria</i> (4)	Cyprus oak	ملول
<b>SANTALACEAE</b>	<b>Santalaceae</b>	<b>صندليات</b>
<i>Osyris alba</i>	Poet's-cassia	صندل ابيض
<b>ARISTOLOCHIACEAE</b>	<b>Aristolochiaceae</b>	<b>زرونديات</b>
<i>Aristolochia altissima</i> (3)	Tall birthwort	زراوند شاهق
<i>Aristolochia poecilantha</i> (4)	Party-colored birthwort	خيار الغنم
<i>Aristolochia scabridula</i> (2)	Roughish birthwort	زراوند أخيرش
<b>POLYGONACEAE</b>	<b>Polygonaceae</b>	<b>فصيلة عصا الراعي</b>
<i>Atraphaxis billardieri</i> (4)	Labillardiere's atraphaxis	حميض شرقي
<i>Polygonum cedrorum</i> (2)	Cedar knotweed	قردب الأرز
<i>Polygonum cognatum</i>	Related knotweed	قردب قريب
<i>Polygonum kitaibelianum</i> (4)	Kitaibel's knotweed	قردب كتيل
<i>Rumex nepalensis</i>	Nepal sorrel	حميض نيبال

<b>CHENOPODIACEAE</b>	<b>Chenopodiaceae</b>	سرمقيات
<i>Atriplex lasiantha</i>	Woolly-flowered orache	سرمق وبر الزهر
<i>Chenopodium foliosum</i>	Strawberry goosefoot	اثينه وريقه
<b>AMARANTHACEAE</b>	<b>Amaranthaceae</b>	قطيفيات
<i>Amaranthus retroflexus</i>	Hairy amaranth	دلاق
<b>PHYTOLACCACEAE</b>	<b>Phytolaccaceae</b>	لكيات
<i>Phytolacca pruinosa</i> (4)	Frosty pokeweed	لكية حبيبة
<b>CARYOPHYLLACEAE</b>	<b>Caryophyllaceae</b>	قرنفليات
<i>Arenaria leptoclados</i>	Slender-branched sandwort	رملية
<b>Cerastium brachypetalum roeseri</b>	Short-petalled mouse-ear-chickweed	قرناء قصيرة البتلات
<i>Cerastium dichotomum</i>	Dichotomus mouse-ear-chickweed	قرناء ثنائية التشعب
<i>Cerastium inflatum</i> (4)	Bladdery mouse-ear-chickweed	قرناء منتفخة
<i>Dianthus micranthus</i> (4)	Small-flowered pink	قرنفل صغير الورق
<i>Dianthus karami</i> (2)	Karam's pink	قرنفل كرم
<i>Dianthus libanotis</i> (4)	Mountain-spignel pink	قرنفل سحاري
<b>Dianthus strictus multipunctatus</b> (4)	Upright pink	قرنفل قائم
<i>Dianthus strictus subenervis</i> (4)	Upright pink	قرنفل قائم
<i>Herniaria incanna</i>	Hoary rupturewort	نبات الشيخ
<i>Minuartia globulosa</i> (4)	Globuled sandwort	منورتية كرويه
<i>Minuartia hamata</i>	Hooked sandwort	منورتية صناريه
<i>Minuartia intermedia</i>	Intermediate sandwort	منورتية متوسطه
<i>Minuartia meyeri</i> (4)	Meyer's sandwort	منورتية مير
<i>Paronychia echinata</i>	Echinulate nailwort	حربت مقننذ
<i>Silene aegyptiaca</i>	Egyptian catchfly	شنتان النوريه
<i>Silene damascena</i> (2)	Damascus catchfly	سيلينة دمشق
<i>Silene italica</i>	Italian catchfly	سيلينة ايطالية
<i>Silene libanotica</i> (4)	Lebanon catchfly	سيلينة مخروطية الزهر
<i>Silene longipetala</i> (4)	Long-petalled catchfly	سيلينة مخروطية الزهر
<i>Silene makmeliana</i> (2)	Makmel catchfly	سيلينة المكمل
<i>Telephium imperati orientale</i> (4)	True orpine	بخور البربر



<i>Velesia rigida</i>	Rigid velesia	دبيقه
<b>LAURACEAE</b>	<b>Lauraceae</b>	فصيلة الغار
<i>Laurus nobilis</i>	Laurel	غار
<b>BERBERIDACEAE</b>	<b>Berberidaceae</b>	بربريسيات
<i>Berberis libanotica</i>	Lebanon barberry	بربريس لبناني
<b>RANUNCULACEAE</b>	<b>Ranunculaceae</b>	حوذانيات
<i>Anemone blanda</i> (4)	Mountain anemone	شفار جبلي
<i>Consolida rigida</i> (4)	White larkspur	قنصليده قاسيه
<i>Delphinium peregrinum</i> (4)	Violet delphin-flower	عايق رحال
<i>Ficaria ficarioides</i> (4)	Ficaria	تينية
<i>Myosurus minimus</i>	Least mouse-tailed	ذنب الفار القزم
<i>Ranunculus cuneatus</i> (4)	Cuneate buttercup	حوذان اسفيني
<i>Ranunculus hierosolymitanus</i> (4)	Jerusalem buttercup	حوذان القدس
<i>Ranunculus schweinfurthii</i> (2)	Schweinfurth's buttercup	حوذان شونفرت
<b>PAPAVERACEAE</b>	<b>Papaveraceae</b>	خشخاشيات
<i>Corydalis rutifolia</i> (4)	Rue-leaved corydalis	قبريه سدابه الورق
<i>Corydalis solida brachyloba</i> (2)	Solid corydalis	قبرية مليئة
<i>Fumaria asepala</i> (4)	White fumitory	شاهترج
<i>Glaucium leiocarpum</i> (4)	Yellow horned-poppy	ماميثا صفراء
<i>Hypecoum imberbe</i> (4)	Horned cumin	هبيقون أمرد
<i>Papaver umbonatum</i>	Bossed poppy	خشخاش
<b>BRASSICACEAE (CRUCIFERAE)</b>	<b>Cruciferae</b>	صليبيات
<i>Alyssum baumgartnerianum</i> (4)	Baumgartner's madwort	الوسن بمغرتر
<i>Alyssum billardieri</i> (4)	Labillardiere's madwort	الوسن بلرديير
<i>Alyssum contemptum</i> (4)	Dwarf madwort	الوسن قزم
<i>Alyssum mouradicum</i> (4)	Murada madwort	الوسن مرادة
<i>Alyssum murale</i>	Wall madwort	الوسن الحيطان
<i>Alyssum repens</i> (4)	Creeping madwort	الوسن زاحف
<i>Alyssum sibirnyi</i>	Sibirnyi's madwort	الوسن ستربرني
<i>Anchonium billardieri</i> (2)	Labillardiere's anconium	انخنيوم لابلرديير
<i>Arabis aucheri</i> (4)	Aucher's rock-cress	اربيس اوشيه
<i>Arabis caucasica</i> (4)	Caucasian rock-cress	اربيس قفقاسي
<i>Arabis verna</i>	Spring rock-cress	اربيس ربيعي
<i>Barbarea minor</i> (4)	Lesser winter-cress	برباريه صغيره
<i>Biscutella ciliata</i>	Ciliate buckler-mustard	بسكوتله مهدبه
<i>Cardamine graeca</i>	Greek bitter-cress	صناب يوناني

<i>Cardaria chalepensis</i> (4)	Aleppo cardaria	قنبيرة حلب
<i>Clypeola jonthlaspi</i>	Disk-cress	ثريس قرصي
<i>Erophila setulosa</i> (4)	Bristly faverel	اروفيله شويكيه
<i>Erysimum goniocaulon</i> (4)	Angled-stemmed erysimum	اريسوموم زاوي الساق
<i>Erysimum repandum</i>	Small-flowered erysimum	اريسوموم منبسط
<i>Fibigia eriocarpa</i> (4)	Woolly-fruited fibigia	فبيجية صوفية الثمر
<i>Hesperis pendula</i> (4)	Pendulous dame's-violet	مسائية متدليلة
<i>Isatis lusitanica</i> (4)	Portuguese woad	وسمة برتغالية
<i>Nasturium officinal</i>	Common water-cress	قره
<i>Peltaria angustifolia</i> (4)	Shieldwort	هريرة
<i>Thlaspi brevicale</i> (2)	Short-stemmed penny-cress	تلسبي قصير الساق
<i>Thlaspi microstylum</i> (4)	Small-styled penny-cress	تلسبي صغير القلم
<b>CRASSULACEAE</b>	<b>Crassulaceae</b>	<b>مخدرات</b>
<i>Rosularia libanotica</i>	Lebanon rosularia	وريدة لبنان
<i>Sedum tenuifolium</i>	Slender-leaved stonecrop	حيون نحيل الورق
<i>Umbilicus erectus</i> (4)	Yellow nevelwort	سرة منتصبه
<b>ROSACEAE</b>	<b>Rosaceae</b>	<b>ورديات</b>
<i>Crataegus azarolus</i> (4)	Azarole	زعرور شانغ
<i>Crataegus monogyna</i>	Whitehorn	زعرور ابيض
<i>Geum urbanum</i>	Herb-benet	جيوم
<i>Pirus syriaca</i> (4)	Syrian pear	نجاص بري
<i>Potentilla geranioides syriaca</i>	Syrian cran's-bill	مقوية سورية
<i>Poterium spinosum</i>	Spiny burnet	بلان
<i>Prunus korschinskii</i>	Korshinsky's almond	لوز كرشنسكي
<i>Prunus microcarpa</i> (4)	Small-fruited cherry	كرز صغير الثمر
<i>Prunus mahaleb</i>	Mahaleb	محلّب
<i>Prunus prostrata</i>	Prostrate cherry	حيحون
<i>Prunus ursine</i> (4)	Bear plum	برقروق
<i>Rosa canina</i>	Dog rose	نسرين
<i>Rosa glutinosa</i>	Mediterranean sweet briar	ورد دبق
<i>Rubus collinus</i>	Hill blackberry	عليق الروابي
<i>Rubus tomentosus</i>	Tomentose blackberry	عليق لبيدي
<i>Sorbus flabellifolia</i> (4)	Fan-leaved service-tree	غبيراء مروحية الورق
<i>Sorbus torminalis</i>	Wild service-tree	غبيراء المغص
<b>FABACEAE (PAPILIONACEAE)</b>	<b>Fabaceae</b>	<b>فراشيات</b>
<i>Astragalus coluteoides</i> (2)	Bladder-senna milk-vetch	اسطر اغالس قنصوري
<i>Astragalus cruentiflorus</i> (2)	Red-flowered milk-vetch	اسطر اغالس احمر
<i>Astragalus echinus</i> (4)	Hedgehog milk-vetch	اسطر اغالس كباية

		الشوك
<i>Astragalus emarginatus</i> (2)	Emarginate milk-vetch	اسطر اغالس مفوق
<i>Astragalus gummifer</i>	Gum milk-vetch	كثيراء
<i>Astragalus pinetorum</i> (4)	Pinewood milk-vetch	اسطر اغالس الصنوبر
<i>Astragalus sofarensis</i> (2)	Sawfar milk-vetch	اسطر اغالس صوفر
<i>Astragalus zachlensis</i> (2)	Zahlah milk-vetch	اسطر اغالس زحلة
<i>Cytisus syriacus</i> (2)	Syrian broom	لزان سوري
<i>Ervum orientale</i> (4)	Oriental ervum	ارفوم شرقي
<i>Hippocrepis unisiliquosa</i>	Common horsshoe-vetch	نمت أحادي الخردلة
<i>Hymenocarpus circinatus</i>	Circular medick	هيمنوكربوس
<i>Lathyrus digitatus</i> (1) (4)	Fingered vetchlink	جلبان اصبعي
<i>Lathyrus hierosolymitanus</i> (4)	Jerusalem vetchlink	جلبان القدس
<i>Lathyrus inermis</i> (4)	Unarmed vetchlink	جلبان أمرط
<i>Lathyrus libani</i> (2) (3)	Lebanon vetchlink	جلبان لبنان
<i>Lathyrus nissolia</i> (3)	Grass vetchlink	جلبان نسول
<i>Lotus angustissimus</i>	Narrow birdsfoot-trefoil	لوطس ضيق
<i>Lotus corniculatus alpinus</i>	Horned birdsfoot-trefoil	قرن الغزال
<i>Lotus gebelia</i> (4)	Gebelia birdsfoot-trefoil	جبيلية
<i>Lotus tenuis</i>	Slender birdsfoot-trefoil	لوطس نحيل
<i>Lupinus hirsutus</i>	Hirsute lupin	ترمس أزب
<i>Medicago falcata</i>	Falcate medick	فصة منجلية
<i>Medicago lupulina</i>	Black medick	فصة سوداء
<i>Medicago minima</i>	Least medick	فصة قزما
<i>Medicago sativa</i> (1)	Lucerne	قتات
<i>Medicago x varia</i>	Varia medick	فصة محيرة
<i>Ononis natrux</i>	Shrubby restharrow	شبرق ثعباني
<i>Ononis pusilla</i>	Dwarf restharrow	شبرق قزم
<i>Securegera securidaca</i>	Hatchet-vetch	صبيرة
<i>Spartium junceum</i>	Spanish broom	وزال
<i>Trifolium boissieri</i> (4)	Boissier's clover	نفل بواسيه
<i>Trifolium campestre</i>	Hop trefoil	نفل حقلي
<i>Trifolium fragiferum</i>	Strawberry trefoil	نفل فراولي
<i>Trifolium medusaeum</i> (2)	Medusa's clover	نفل ميدوسا
<i>Trifolium pauciflorum</i> (4)	Few-flowered clover	نفل قليل الزهر
<i>Trifolium physodes</i> (1)	Bladder clover	نفل مثاني
<i>Trifolium plebium</i> (2)	Common clover	نفل شائع
<i>Trifolium speciosum</i>	Showy clover	نفل بهي
<i>Trigonella berythea</i> (4)	Beirut fenugreek	حلبة بيروت
<b>Trigonella brachycarpa aucheri</b> <b>(4)</b>	Short-fruited fenugreek	حلبة قصيرة الثمر
<i>Trigonella spinosa</i> (4)	Spiny fenugreek	حلبة شائكة
<i>Vicia narbonensis</i>	Narbonne vetch	بيقية
<i>Vicia tenuifolia</i>	Slender-leaved vetch	بيقية نحيلة الورق

<b>GERANIACEAE</b>	<b>Geraniaceae</b>	غرناقيات
<i>Erodium acaule</i>	Stemless stork's-bill	جزاب لاساقي
<i>Erodium cicutarium</i>	Hemlock stork's bill	جزاب شوكراني
<i>Erodium gruinum</i> (4)	Crane stork's bill	جزاب كركي
<i>Geranium libani</i> (4)	Lebanon geranium	غرناقى لبنان
<i>Geranium libanoticum</i> (2)	Lebanese geranium	غرناقى لبناني
<b>LINACEAE</b>	<b>Linaceae</b>	كتانيات
<i>Linum bienne</i>	Pale flax	كتان محول
<i>Linum nodiflorum</i>	Knotted flax	كتان عقدي الزهر
<i>Linum pubescens</i> (4)	Downy flax	كتان أزغب
<b>POLYGALACEAE</b>	<b>Polygalaceae</b>	مستدرات
<i>Polygala supine</i> (4)	Trailing milkwort	مستدرة مفترشة
<b>ANACARDIACEAE</b>	<b>Anacardiaceae</b>	سماقيات
<i>Rhus coriara</i>	Syrian sumach	سماق
<b>ACERACEAE</b>	<b>Aceraceae</b>	قيقيات
<i>Acer tauricum</i> (4)	Taurus maple	قيقب طوروس
<b>EUPHORBIACEAE</b>	<b>Euphorbiaceae</b>	فربينيات
<i>Euphorbia aulacosperma</i> (4)	Furrowed-seeded spurge	فربيون مثلث البزرة
<b>MALVACEAE</b>	<b>Malvaceae</b>	خبازيات
<i>Alcea digitata</i> (4)	Fingered hollyhock	خسمية اصبعية
<i>Alcea kurdica coelesyriaca</i> (4)	Kurdish hollyhock	خسمية بقاعية
<i>Kitaibelia balansae</i>	Balansa's kitaibelia	كتيبيلية بلنسا (تذكر لأول مرة من لبنان)
<b>GUTTIFERAE</b>	<b>Guttiferae</b>	هيوفاريقون
<i>Hypericum hircinium</i>	Stinking St John's-wort	دموع البسينات
<i>Hypericum libanoticum</i> (2)	Lebanon St John's-wort	دادي لبنان
<i>Hypericum montbretii</i> (4)	Montbret's St John's-wort	دادي مونبره

<i>Hypericum scabrum</i> (4)	Rugged St John's-wort	داذي احرش
<i>Hypericum thymifolium</i> (4)	Thym-leaved St John's-wort	داذي سعترى الورق
<b>CISTACEAE</b>	<b>Cistaceae</b>	لاذانيات
<b>Halimium umbellatum syriacum</b> (2)	Syrian halimium	هلميوم سوري
<i>Helianthemum ledifolium</i>	Ledum-leaved sunrose	رقروق
<b>RHAMNACEAE</b>	<b>Rhamnaceae</b>	سدريات
<i>Rhamnus cathartica</i>	Purging buckthorn	شجرة الدكن
<i>Rhamnus punctata</i> (4)	Dotted buckthorn	عجرم
<b>LYTHRACEAE</b>	<b>Lythraceae</b>	حنانيات
<i>Lythrum junceum</i>	Rushy lythrum	فرنل أسلي
<b>THYMELAEACEAE</b>	<b>Thymelaceae</b>	مازيونيات
<i>Daphne oleoides</i>	Olive-like daphne	عود الخل
<b>APIACEAE (UMBELLIFERAE)</b>	<b>Umbelliferae</b>	خيميات
<i>Anthriscus lamprocarpa</i> (4)	Bright-fruited beakchervil	انثرسكوس لامع الثمر
<i>Bupleurum gerardii</i>	Gerard's hare's-ear	حلباب جيرار
<b>Bupleurum linearifolium</b> <b>irregulare</b> (4)	Linear-leaved hare's-ear	حلباب خطي الورق
<i>Chaerophyllum macrospermum</i>	Large-seeded chervil	سرفل كبير البزرة
<i>Cnidium orientale</i> (4)	Oriental cnidium	بادجان شرقي
<i>Danaa cornubiensis</i>	Cornish lovage	دناية كرنوبيا
<i>Foeniculum vulgare</i>	Common fennel	شمار
<i>Hippomarathrum boissieri</i> (4)	Boissier's horse-fennel	رازيانج بواسيه الكبير
<i>Lecoquia cretica</i> (4)	Cretean lecoquia	لككية كريت
<i>Peucedanum depauperatum</i> (4)	Stunted sulphurwort	بوسيدنوم مفقر
<i>Pimpinella tragium</i>	Tragium burnet-saxifrage	بمبلة تيسية
<i>Scandix pecten-veneris</i>	Venus'-comb	مشط الزهرة
<i>Scandix stellata</i>	Stellate shepherd's-needle	مشبطة نجمية
<i>Sison exaltatum</i> (2)	Lofty sison	غرة باسقة
<i>Torilis chrysocarpa</i>	Golden-fruited hedge-parsley	توريلس متجانس الورق
<i>Torilis leptophylla</i>	Slender-leaved hedge-parsley	توريلس نحيل الورق
<i>Turgenia latifolia</i>	Broad-leaved but-parsley	ترجينية عريضة الورق

<i>Turgeniopsis foeniculacea</i> (4)	Fennel turgeniopsis	ترجنسيس شماري
<b>ERICACEAE</b>	<b>Ericaceae</b>	خلنجيات
<b>Rhododendron ponticum brachycarpum</b>	Pontic rhododendron	وردية بنطس
<b>PRIMULACEAE</b>	<b>Primulaceae</b>	ربيعيات
<i>Androsace maxima</i>	Great androsace	اندروساقس عظيم
<i>Cyclamen coum</i> (4)	Kos cyclamen	بخور مريم كوس
<b>PLUMBAGINACEAE</b>	<b>Plumbaginaceae</b>	رصاصيات
<i>Acantholimon libanoticum</i> (2)	Lebanon prickly-thrift	كبابة لبنانية
<i>Acantholimon ulicinum</i> (4)	Gorse prickly-thrift	غملول جولقي
<b>STYRACACEAE</b>	<b>Styracaceae</b>	إصطركيات
<i>Styrax officinalis</i> (4)	Storax	حوز
<b>APOCYNACEAE</b>	<b>Apocynaceae</b>	دفليات
<i>Vinca libanotica</i> (4)	Lebanon periwinkle	قصاب
<b>GENTIANACEAE</b>	<b>Gentianaceae</b>	جنطيانيات
<i>Blackstonia perfoliata</i>	Perfoliate blackstonia	بلكستونيا مخروقة
<b>CONVOLVULACEAE</b>	<b>Convolvulaceae</b>	محموديات
<b>Convolvulus dorycnium oxycephalus</b> (4)	Dorycnium bindweed	لبلاب دوركنيوم
<i>Convolvulus scammonia</i> (4)	Syrian bindweed	سقمونيا
<i>Convolvulus libanotica</i> (2)	Lebanon bindweed	خوپطمة
<b>CUSCUTACEAE</b>	<b>Cuscutaceae</b>	فصيلة كشوث

<i>Cuscuta approximata</i>	Common dodder	كشوت متقارب
<i>Cuscuta balansae</i> (4)	Balansa's dodder	كشوت بلنسا
<i>Cuscuta monogyna</i>	Oriental dodder	كشوت أحادي القلم
<i>Cuscuta planiflora</i>	Flat-flowered dodder	شبيكة
<b>BORAGINACEAE</b>	<b>Boraginaceae</b>	<b>حمحميات</b>
<i>Brunnera orientalis</i> (4)	Oriental brunnera	برنيرة شرقية
<i>Cynoglossum nebrodense</i>	Monti Nebrodi hound's-tongue	لسان الكلب النبرودي
<i>Myosotis refracta</i>	Reflexed forget-me-not	ميوزوتيس منحرف
<i>Onosma frutescens</i> (4)	Bushy golden-drop	شنجار دغلي
<i>Onosma sericea</i> (4)	Silky golden-drop	شنجار حريري
<i>Symphytum palaestinum</i> (4)	Palestine comfrey	لسان الثور
<b>LAMIACEAE (LABIATAE)</b>	<b>Lamiaceae</b>	<b>شفويات</b>
<i>Ajuga tridactylites palaestina</i> (4)	Three-fingered bugle	عرصف ثلاثي الأصابع
<i>Ballota saxatilis</i>	Rock horehound	بلوتة الصخور
<i>Calamintha rotundifolia</i>	Marjoram-leaved calamint	عشبة الضغط
<i>Eremostachys laciniata</i> (4)	Desert spike	هجنبل
<i>Lallemania iberica</i> (4)	Iberian dragon's-head	للمنتية إيبيريا
<i>Lamium amplexicaule</i>	Great henbit	لميوم معانق
<i>Lamium striatum</i> (4)	Striate dead-nettle	لميوم مخطط صغير
<i>Lamium truncatum</i> (4)	Truncate dead-nettle	لميوم مقطوم
<i>Lavandula stoechas</i>	French lavender	لاونده
<i>Marrubium radiatum</i> (4)	Rayed white-horehound	فراسين شعاعي
<i>Micromeria graeca</i>	Greek savory	شميسة يونانية
<i>Micromeria myrtifolia</i>	Myrtle-leaved savory	شميسة زوفا،
<i>Nepata cilicica</i> (4)	Cilician catmint	قطرم قيليقيا
<i>Nepata curviflora</i> (4)	Syrian catmint	قطرم سوري
<i>Nepata italica</i>	Italian catmint	قطرم ايطالي
<i>Origanum ehrenbergii</i> (1) (2)	Ehrenberg marjoram	زعر الصنوبر
<i>Origanum syriacum</i> (1)	Origanum syriacum	زعر عادي
<i>Phlomis brevilabris</i> (2)	Short-lipped phlomis	عيزارة قصيرة الشفة
<i>Phlomis chrysophylla</i> (4)	Golden-leaved phlomis	معصوص
<i>Phlomis rigida</i> (4)	Red phlomis	عيزارة حمراء
<i>Prunella orientalis</i> (4)	Oriental self-heal	قلاع شرقي
<i>Prunella vulgaris</i>	Common self-heal	قلاع ميدول
<i>Salvia microstegia</i> (4)	Fleecy sage	قويصة صغيرة الغطاء
<i>Salvia multicaulis</i> (4)	Shell-flower sage	شافية كثيرة السوق

<i>Salvia tomentosa</i> (4)	Tomentose sage	شافية لبديّة
<i>Salvia viscosa</i> (4)	Viscous sage	قويصة لزجة
<i>Scutellaria brevibracteata</i> (4)	Short-bracteate skullcap	هربون قصير القنابات
<i>Scutellaria tomentosa</i> (4)	Tomentose skullcap	هربون لبدي
<i>Scutellaria utriculata</i> (2)	Bladder skullcap	هربون قربي
<i>Sideritis libanotica</i> (4)	Lebanon ironwort	فقاح لبنان
<i>Stachys distans</i> (4)	Distant woundwort	قرطوم متباعّد
<i>Stachys hydrophylla</i> (2)	Water woundwort	قرطوم أليف الماء
<i>Teucrium divaricatum</i>	Spreading germander	جعدة متشعبة
<i>Teucrium polium</i>	Poley	جعدة
<i>Teucrium scordioides</i>	Scordium-like germander	جعدة كاذبة
<i>Teucrium stachyophyllum</i> (4)	Woundwort-leaved germander	جعدة قرطومية الورق
<i>Ziziphora canescens</i> (4)	Hoary ziziphora	زيزفورة مشعرة
<i>Ziziphora capitata</i>	Headed ziziphora	زيزفورة رأسية، زيزفران
<b>SOLANACEAE</b>	<b>Solanaceae</b>	<b>بادنجانيات</b>
<i>Datura stramonium</i>	Stramonium	داتورة شائكة
<i>Hyoscyamus reticulatus</i>	Netted henbane	بنج شبكي
<i>Solanum dulcamara</i>	Bittersweet	عنب الديب
<b>SCROPHULARIACEAE</b>	<b>Scrophulariaceae</b>	<b>خنزيريات</b>
<i>Anarrhinum orientale</i> (4)	Oriental anarrhinum	سوسل شرقي
<i>Kickxia sieberi</i>	Sieber's fluellen	ككسية سبير
<i>Linaria chalepensis</i>	Aucher's toadflax	كتانية اوشيه
<i>Odontites aucheri</i>	Aucher's odontites	ضرسية اوشيه
<i>Parentucellia latifolia</i>	Broad-leaved eyebright	برنتوشيلية عريضة الورق
<i>Scrophularia rubricaulis</i> (4)	Red-stemmed figwort	خنازيرية حمراء الساق
<i>Verbascum cedreti</i> (4)	Cedar mullein	بوصير الأرز
<i>Verbascum gaillardotii</i> (4)	Gaillardot's mullein	بوصير غيردوه
<i>Verbascum leptostachyum</i> (2)	Slender-spiked mullein	بوصير نحيل السنبلّة
<i>Verbascum orientale</i> (4)	Oriental mullein	بوصير نحيل السنبلّة
<i>Verbascum tiberiadis</i> (4)	Tiberias mullein	بوصير شرقي
<i>Verbascum tripolitanum</i>	Tripoli mullein	بوصير طرابلس
<i>Veronica cymbalaria</i>	Cymbal speedwell	فيرونيكة صنجية
<i>Veronica orientalis</i> (4)	Oriental speedwell	فيرونيكة شرقية
<i>Veronica polifolia</i> (4)	Polium-leaved speedwell	فيرونيكة جعدية الورق
<i>Veronica syriaca</i> (4)	Syrian speedwell	فيرونيكة سورية
<b>OROBANCHACEAE</b>	<b>Orobanchaceae</b>	<b>جعفليات</b>



<i>Orobanche camptolepis</i> (4)	Bent-scaled broomrape	جعفيل منحني الحراشف
<b>RUBIACEAE</b>	<b>Rubiaceae</b>	<b>فويات</b>
<i>Asperula arvensis</i>	Field woodruff	اسبرولة الحقول
<i>Asperula breviflora</i> (2)	Short-flowered woodruff	اسبرولة قصيرة الزهر
<i>Asperula glareosa</i> (4)	Scree woodruff	اسبرولة الركام
<i>Asperula libanotica</i> (2)	Lebanon woodruff	اسبرولة لبنان
<i>Crucianella macrostachya</i> (4)	Common crosswort	صليبية كبيرة السنابل
<i>Cruciata coronata</i> (4)	Crowned mugwort	مصلبة مكلمة
<i>Galium hierosolymitanum</i> (4)	Jerusalem bedstraw	غاليوم القدس
<i>Galium incanum</i> (4)	Hoary bedstraw	غاليوم مبيض
<i>Galium libanoticum</i>	Lebanon bedstraw	غاليوم لبنان
<i>Galium murale</i>	Wall bedstraw	غاليوم الحيطان
<i>Galium verticillatum</i>	Whorld bedstraw	غاليوم كمكبي
<i>Galium verum</i>	Ladies bedstraw	قيطوم
<i>Gallium peplidifolium</i> (4)	Peplis-leaved bedstraw	غاليوم ببليشي الورق
<i>Rubia aucheri</i> (4)	Aucher's madder	فوة اوشيه
<i>Sherardia arvensis</i>	Field madder	شيرردية الحقول
<b>CAPRIFOLIACEAE</b>	<b>Caprifoliaceae</b>	<b>بلسانيات</b>
<i>Lonicera etrusca</i>	Etruscan honeysuckle	لونيسرة اتروريا
<i>Lonicera nummulariifolia</i>	Nummular-leaved honeysuckle	لونيسرة نقدية الورق
<b>VALERIANACEAE</b>	<b>Valerianaceae</b>	<b>ناردينيات</b>
<i>Centranthus longiflorus</i> (4)	Long-flowered sput-valerian	عصاية الناطور
<i>Valeriana dioscoridis</i> (4)	Dioscorides' valerian	ناردين، أصابع الراعي
<i>Valerianella dactylophylla</i> (4)	Finger-leaved cornsalad	سمنة أصبعية الورق
<i>Valerianella echinata</i>	Prickly cornsalad	سمنة مقنفة
<b>DIPSACACEAE</b>	<b>Dipsacaceae</b>	<b>دبساسيات</b>
<i>Cephalaria cedrorum</i> (2)	Cedar scabious	سيوان الأرز
<i>Cephalaria stellipilis</i> (4)	Star-headed cephalaria	سيوان نجمي الوبر
<i>Morina persica</i> (4)	Persian whorlflower	مريئة فارسية
<i>Scabiosa argentea</i>	Silvery scabious	جربية فضية
<i>Scabiosa palaestina</i> (4)	Palestine scabious	دولاب الهوا

<b>CUCURBUTACEAE</b>	<b>Cucurbitaceae</b>	<b>قرعيات</b>
<i>Bryonia multiflora</i> (4)	Many-flowered bryony	فاشرا كثيرة الزهر
<i>Bryonia syriaca</i> (4)	Syrian bryony	مداد الحية
<b>CAMPANULACEAE</b>	<b>Campanulaceae</b>	<b>بوقيات</b>
<i>Asyneuma rigidum</i> (4)	Rigid asyneuma	اسينمة قاسية
<i>Campanula cymbalaria</i>	Cymbal bellflower	جريس صنجي
<i>Campanula peregrina</i> (4)	Foreign bellflower	جريس رحال
<i>Campanula stricta libanotica</i> (4)	Lebanon upright bellflower	جريس قائم لبناني
<i>Legousia pentagonia</i> (4)	Large Venus'-looking-glass	لغوزية خماسية
<b>ASTERACEAE (COMPOSITAE)</b>	<b>Asteraceae</b>	<b>مركبات</b>
<i>Achillea kotschyi</i>	Kotschy's milfoil	اخيلية كوتشي
<i>Anthemis cretica cassia</i> (4)	Cretean chamomile	بهار كريت
<i>Anthemis tinctoria discoidea</i>	Yellow chamomile	بابونج اصفر
<i>Carlina involucrate libanotica</i> (4)	Lebanese carline	كرلينة لبنانية
<i>Centaurea triumfetti</i> (4)	Trionfetti's knapweed	قنطريون تريفتي
<i>Cephalorrhynchus tuberosus</i> (4)	Tuberous cephalorrhynchus	سفلورنشس عسقولي
<i>Cicerbita mulgedioides</i> (4)	Mulgedium sow-thistle	سيسر بيته
<i>Crepis hierosolymitana</i> (4)	Jerusalem hawkweed	سراغة القدس
<i>Crepis reuteriana</i> (4)	Reuter's hawkweed	سراغة روتر
<i>Doronicum orientale</i>	Oriental leopard's-bane	درونق شرقي
<i>Eupatorium cannabinum</i>	Common hemp-agrimony	اوبتريوم قنبي
<i>Filago anatolica</i> (4)	Anatolian cotton-rose	قطينة الأناضول
<i>Gnaphalium luteo-album</i>	Jersey cudweed	رعراع
<i>Gundelia tournefortii</i>	Tournefort's gundelia	عكوب
<i>Helichrysum c. conglobatum</i> (1) (3)	Globe everlasting	خالدة مكورة
<i>Helichrysum pallasii</i> (4)	Pallas' everlasting	خالدة بلاس
<b>Lapsana communis ramosissima</b> (4)	Common nipplewort	خفج شائع
<i>Leontodon asperrimus</i> (4)	Rough dandelion	يعضيض جاسي
<i>Leontodon tuberosus</i>	Tuberous dandelion	يعضيض عسقولي
<i>Notobasis syriaca</i>	Syrian thistle	لحلاج
<i>Onopordum cynarocephalum</i> (4)	plumed-thistle	اقسون حرفشي الرأس
<i>Picris strigosa</i> (4)	Strigose ox-tongue	مريز شانك الزغب
<i>Ptilostemon diacantha</i> (2)	Two-spined ptilostemon	بتيلاستمون ذو شوكتين

<i>Pulicaria aurantica</i> (4)	Hauran fleabane	رعاع حوران
<i>Scorzonera cana</i>	White viper's-grass	دبح ابيض
<i>Scorzonera mollis</i>	Wave-leaved viper's-grass	دبح لين
<i>Senecio d. doriiformis</i> (4)	Doria-like groundsel	شرونة دورية كاذبة
<i>Senecio vernalis</i>	Spring groundsel	شرونة ربيعية
<i>Serratula pusilla</i> (4)	Dwarf saw-wort	ورخة قزما
<i>Siebera pungens</i> (4)	Pungent siebera	سيبرة شانكة
<i>Steptorhamphus tuberosus</i> (4)	Tuberous steptorhamphus	ستبتورمفوس
<i>Tanacetum cilicium</i> (4)	Cilician tansy	تناستوم فضي
<i>Taraxacum aleppicum</i> (4)	Aleppo dandelion	طرخشقون حلب
<i>Taraxacum syriacum</i>	Syrian dandelion	طرخشقون سوري
<i>Taraxacum officinale</i>	Common dandelion	طرخشقون طبي
<i>Tragopogon bupthalmoides</i> (4)	Bull's-eye goat's-beard	ذنب الفرس
<i>Tragopogon longirostris</i> (4)	Long-beaked goat's-beard	سلسفيل طويل المنقار

**ANNEX 2: Table 2:** List of mammals at Al-Chouf Cedar Reserve.

(1) refers to globally threatened species

(2) refers to locally threatened species

(3) refers to endemic species

(4) refers to wholly or partially restricted species to East Mediterranean area

(5) rare species

<b>SCIENTIFIC NAME</b>	<b>English Name</b>	<b>Arabic Name</b>
<b>ERINACEIDAE</b>		
<i>Erinaceus europaeus concolor</i> (4)	<b>Hedgehog</b>	كبابة الشوك
<b>SORICIDAE</b>		
<i>Crocidura russula</i>	<b>Common White Toothed Shrew</b>	زبابة شائعة
<b>RHINOLOPHIDAE</b>		
<i>Rhinolophus ferrumequinum ferrumequinum</i> (1) (5)	<b>Greater Horseshoe</b>	عماش كبير
<i>Rhinolophus hipposideros minimus</i> (1) (4) (5)	<b>Lesser Horseshoe</b>	الخفاش الأصغر
<b>MOLOSSIDAE</b>		
<i>Tadarida teniotis</i> (5)	<b>European Free-Tailed Bat</b>	وطواط ابو ذئب حر
<b>VESPERTILIONIDAE</b>		
<i>Myotis blythi omari</i> (4) (5)	<b>Lesser Mouse-Eared Bat</b>	وطواط عمري
<i>Pipistrellus pipistrellus pipistrellus</i> (1) (5)	<b>Common Pipistrelle</b>	خفد أو خفاش قديم
<i>Pipistrellus kuhli ikhawanius</i> (1) (4)	<b>Kuhl's Pipistrelle</b>	خفاش كوهلي
<b>CANIDAE</b>		
<i>Canis aureus syriacus</i> (4)	<b>Jackal</b>	ابن اوى
<i>Canis lupus pallipes</i> (1) (2) (4) (5)	<b>Wolf</b>	ذئب

<i>Vulpus vulpus palaestina</i> (4)	<b>Red Fox</b>	الثعلب
<b>MUSTELIDAE</b>		
<i>Martes foina syriaca</i> (4)	<b>Stone Martin</b>	النمس
<i>Vormela peregusna syriaca</i> (1, 4)	<b>Marbled Polecat</b>	الظربان
<i>Mustela nivalis</i> (5)	<b>Weasel</b>	ابن عرس
<i>Meles meles canescens</i> (1)	<b>Badger</b>	الغدير
<i>Hyaena hyaena syriaca</i> (1) (4)	<b>Striped Hyaena</b>	الضبع
<b>FELIDAE</b>		
<i>Felis silvestris tristrami</i> (2) (5)	<b>Wild Cat</b>	هر بري
<i>Felis chaus</i> (2)	<b>Jungle Cat</b>	الهر النمر
<i>Caracal caracal schmitzi</i> ? (1) (4) (5)	<b>Caracal Lynx</b>	عناق الأرض
<b>ARTIODACTYLA</b>		
<i>Sus scrofa lybicus</i> (4)	<b>Wild Boar</b>	الخنزير البري
<b>LEPORIDAE</b>		
<i>Lepus capensis syriacus</i> (4)	<b>Cape Hare</b>	ارنب بري
<b>SCIURIDAE</b>		
<i>Sciurus anomalus syriacus</i> (1) (4)	<b>Squirrel</b>	السنجاب
<b>HYSTRICIDAE</b>		
<i>Hystrix indica indica</i>	<b>Porcupine</b>	القنفضة ، النيص
<b>MUSCARDINIDAE</b>		
<i>Eliomys melanurus</i> (1) (4)	<b>Black Tailed Dormouse</b>	فأر البستان

<b>SPALACIDAE</b>		
<i>Spalax leucodon ehrenbergi</i> (4)	<b>Mole-Rat</b>	الخلد
<b>MURIDAE</b>		
<i>Apodemus mystacinus mystacinus</i> (4)	<b>Field Mouse</b>	فأر الحقل
<i>Apodemus sylvaticus</i>	<b>Common Field Mouse</b>	فأر الحرج
<b>CRICETIDAE</b>		
<i>Cricetulus migratorius cinerascens</i> (1)	<b>Grey Hamster</b>	القداد
<i>Meriones tristrami tristrami</i> (4)	<b>Jird</b>	جرذ ترسترام
<i>Microtus nivalis hermonis</i> (4)	<b>Snow Vole</b>	عكبر ثلج حرمون
<i>Microtus guentheri guentheri</i> (4)	<b>Levant Vole</b>	عكبر الحقل

**ANNEX (3):** List of bird species at Al-Chouf Cedar Reserve (Ramadan-Jaradi & Ramadan-Jaradi, in lit.).

Dates and names of observers are given for vagrants and species that were known in the past or discovered recently by the author of this ornithological section. The following abbreviations are used to indicate the species status. A question mark indicates uncertain status. Three stars (\*\*\*) denote threatened species at global level, two stars (\*\*) indicate threatened species at regional level and one star (\*) indicates species that are wholly or largely restricted to the Middle East (after Evans 1994). Lower case abbreviations, e.g. r, sb, s, wv and pm indicate that the species is uncommon or rare at the relevant season in Al-Chouf Cedar Reserve.

- R** =Resident with definite breeding records  
**SB** =Breeding summer visitor  
**S** =Non-breeding summer visitor  
**WV** =Winter visitor  
**PM** =Passage migrant  
**FB** =Formerly bred (no records within the last 20 years)  
**V** =Vagrant  
**E** =Extinct in Lebanon

Species name is followed by the species' present status at Al-Chouf Cedar only.

1. **White Pelican** *Pelecanus onocrotalus* **PM**
2. **Black Stork** *Ciconia nigra* **pm**
3. **White Stork** *Ciconia ciconia*\*\* **PM**
4. **Honey Buzzard** *Pernis apivorus*\*\* **PM**
5. **Black Kite** *Milvus migrans* **pm**

6. **Red Kite** *Milvus milvus* v
7. **Egyptian Vulture** *Neophron percnopterus*\*\* pm
8. **Griffon Vulture** *Gyps fulvus*\*\* pm
9. **Black Vulture** *Aegyptius monachus*\*\*\* v
10. **Short-toed Eagle** *Circaetus gallicus* sb, PM
11. **Marsh Harrier** *Circus aeruginosus* PM
12. **Hen Harrier** *Circus cyaneus* pm
13. **Pallid Harrier** *Circus macrourus* pm
14. **Montagu's Harrier** *Circus pygargus* pm
15. **Goshawk** *Accipiter gentilis* pm
16. **Sparrowhawk** *Accipiter nisus* pm
17. **Levant Sparrowhawk** *Accipiter brevipes*\*\* PM
18. **Common Buzzard & Steppe Buzzard** *Buteo buteo* PM
19. **Long-legged Buzzard** *Buteo rufinus* r, pm, wv
20. **Lesser Spotted Eagle** *Aquila pomarina*\*\* PM
21. **Greater Spotted Eagle** *Aquila clanga*\*\* pm
22. **Steppe Eagle** *Aquila nipalensis* pm
23. **Imperial Eagle** *Aquila heliaca*\*\*\* pm
24. **Golden Eagle** *Aquila chrysaetos* pm
25. **Booted Eagle** *Hieraaetus pennatus* ?sb, pm
26. **Bonelli's Eagle** *Hieraaetus fasciatus* r, pm
27. **Osprey** *Pandion haliaetus* pm
28. **Lesser Kestrel** *Falco naumanni*\*\*\* pm
29. **Kestrel** *Falco tinnunculus* R, PM, wv
30. **Red-footed Falcon** *Falco vespertinus* pm
31. **Merlin** *Falco columbarius* pm, wv
32. **Hobby** *Falco subbuteo* ?sb, PM, wv
33. **Lanner** *Falco biarmicus*\*\* pm
34. **Eleonora's Falcon** *Falco eleonora* pm
35. **Saker Falcon** *Falco cherrug*\*\* pm
36. **Peregrine Falcon** *Falco peregrinus* pm, wv
37. **Chukar Partridge** *Alectoris chukar* R
38. **Quail** *Coturnix coturnix* ?sb, PM, wv
39. **Corncrake** *Crex crex*\*\*\* pm
40. **Crane** *Grus grus* PM
41. **Woodcock** *Saxicola rusticola* pm, WV
42. **Stock Dove** *Columba oenas* v
43. **Woodpigeon** *Columba palumbus* PM, WV
44. **Turtle Dove** *Streptopelia turtur* PM
45. **Great Spotted Cuckoo** *Clamator glandarius* ?sb, pm
46. **Cuckoo** *Cuculus canorus* SB, pm
47. **Barn Owl** *Tyto alba* R
48. **Scops Owl** *Otus scops* sb, PM, wv
49. **Eagle Owl** *Bubo bubo* r
50. **Little Owl** *Athene noctua* r
51. **Tawny Owl** *Strix aluco* R



52. Long-eared Owl *Asio otus* ?r, pm, wv  
 53. Short-eared Owl *Asio flammeus* wv, ?pm  
 54. Nightjar *Caprimulgus europaeus* PM  
 55. Swift *Apus apus* sb, PM  
 56. Pallid Swift *Apus pallidus* pm  
 57. Alpine Swift *Apus melba* sb, PM  
 58. Little Swift *Apus affinis* pm  
 59. European Bee-eater *Merops aptaster* PM  
 60. Roller *Coracias garrulus* pm  
 61. Hoopoe *Upupa epops* R, sb, PM, wv  
 62. Wryneck *Jynx torquilla* pm  
 63. Bimaculated Lark *Melanocorypha bimaiculata* ?sb, pm, wv  
 64. Greater Short-toed Lark *Calandrella brachydactyla* ?sb, PM  
 65. Lesser Short-toed Lark *Calandrella rufescens* pm  
 66. Crested Lark *Galerida cristata* R  
 67. Wood Lark *Lullula arborea* R  
 68. Skylark *Alauda arvensis* PM, wv  
 69. Shore Lark *Eremophila alpestris* R  
 70. Sand Martin *Riparia riparia* PM, WV  
 71. Crag Martin *Ptyonoprogne rupestris* sb, pm  
 72. Swallow *Hirundo rustica* ?sb, PM, wv  
 73. Red-rumped Swallow *Hirundo daurica* pm  
 74. House Martin *Delichon urbica* sb, PM  
 75. Tawny Pipit *Anthus campestris* sb, PM  
 76. Long-billed Pipit *Anthus similes* r  
 77. Tree Pipit *Anthus trivialis* pm, wv  
 78. Meadow Pipit *Anthus pratensis* pm, wv  
 79. Yellow Wagtail *Motacilla flava* SB, pm  
 80. Grey Wagtail *Motacilla cinerea* sb, pm  
 81. White Wagtail *Motacilla alba* PM, wv  
 82. Dipper *Cinclus cinclus* R  
 83. Wren *Troglodytes troglodytes* R  
 84. Dunnock *Prunella modularis* pm, wv  
 85. Rufous Bush Robin *Cercotrichas galactotes* sb, pm  
 86. Robin *Erithacus rubecula* pm, WV  
 87. Thrush Nightingale *Luscinia luscinia* pm  
 88. Nightingale *Luscinia megarhynchos* pm  
 89. Bluethroat *Luscinia svecica* pm, wv  
 90. White-throated Robin *Irania gutturalis*\* pm  
 91. Black Redstart *Phoenicurus ochruros* SB, pm, WV  
 92. Redstart *Phoenicurus phoenicurus* PM  
 93. Whinchat *Saxicola rubetra* PM  
 94. Stonechat *Saxicola torquata* PM  
 95. Isabelline Wheatear *Oenanthe isabellina* sb, pm  
 96. Wheatear *Oenanthe oenanthe* SB, PM, wv  
 97. Pied Wheatear *Oenanthe pleschanka* pm

98. **Black-eared Wheatear** *Oenanthe hispanica* **SB, PM**  
99. **Desert Wheatear** *Oenanthe deserti* **pm**  
100. **Finsch's Wheatear** *Oenanthe finschii*\* **sb, pm, wv**  
101. **Rock Thrush** *Monticola saxatilis* **sb, pm**  
102. **Blue Thrush** *Monticola solitarius* **R, pm, wv**  
103. **Ring Ouzel** *Turdus torquatus* **pm, wv**  
104. **Blackbird** *Turdus merula* **R, pm, wv**  
105. **Fieldfare** *Turdus pilaris* **PM, wv**  
106. **Song Thrush** *Turdus philomelos* **pm, WV**  
107. **Redwing** *Turdus iliacus* **pm, WV**  
108. **Mistle Thrush** *Turdus viscivorus* **pm, WV**  
109. **Cetti's Warbler** *Cettia cetti* **r (localized)**  
110. **Great Reed Warbler** *Acrocephalus arundinaceus* **PM**  
111. **Olivaceous Warbler** *Hippolais pallida* **sb, PM**  
112. **Upcher's Warbler** *Hippolais languida*\* **sb, pm**  
113. **Olive-tree Warbler** *Hippolais olivetorum* **sb, pm**  
114. **Icterine Warbler** *Hippolais icterina* **pm**  
115. **Spectacled Warbler** *Sylvia conspicillata* **R**  
116. **Subalpine Warbler** *Sylvia cantillans* **pm**  
117. **Ménétries's Warbler** *Sylvia mystacea*\* **pm**  
118. **Sardinian Warbler** *Sylvia melanocephala* **R, ?sb, PM, wv**  
119. **Rüppell's Warbler** *Sylvia rueppelli* **pm**  
120. **Orphean Warbler** *Sylvia hortensis* **sb, PM**  
121. **Barred Warbler** *Sylvia nisoria* **pm**  
122. **Lesser Whitethroat** *Sylvia curruca* **sb, PM**  
123. **Whitethroat** *Sylvia communis* **sb, PM**  
124. **Garden Warbler** *Sylvia borin* **pm**  
125. **Blackcap** *Sylvia atricapilla* **sb, PM, WV**  
126. **Bonelli's Warbler** *Phylloscopus bonelli* **SB, PM**  
127. **Wood Warbler** *Phylloscopus sibilatrix* **PM**  
128. **Chiffchaff** *Phylloscopus collybita* **SB, PM, wv**  
129. **Willow Warbler** *Phylloscopus trochilus* **PM**  
130. **Goldcrest** *Regulus regulus* **wv**  
131. **Spotted Flycatcher** *Muscicapa striata* **SB, PM**  
132. **Red-breasted Flycatcher** *Ficedula parva* **pm**  
133. **Semi-collared Flycatcher** *Ficedula semitorquata* **pm**  
134. **Collared Flycatcher** *Ficedula albicollis* **pm**  
135. **Pied Flycatcher** *Ficedula hypoleuca* **pm**  
136. **Sombre Tit** *Parus lugubris* **R**  
137. **Coal Tit** *Parus ater* **R**  
138. **Great Tit** *Parus major* **R**  
139. **Blue Tit** *Parus caeruleus* **R**  
140. **Western Rock Nuthatch** *Sitta neumayer* **R**  
141. **Golden Oriole** *Oriolus oriolus* **pm**  
142. **Isabelline Shrike** *Lanius isabellinus* **pm, wv**  
143. **Red-backed Shrike** *Lanius collurio* **SB, PM**

144. **Woodchat Shrike** *Lanius senator* **sb, PM**  
 145. **Masked Shrike** *Lanius nubicus* **sb, PM**  
 146. **Jay** *Garrulus glandarius* **R**  
 147. **Hooded Crow** *Corvus corone cornix* **R**  
 148. **Starling** *Sturnus vulgaris* **wv**  
 149. **Sparrow** *Passer domesticus* **R**  
 150. **Spanish Sparrow** *Passer hispaniolensis* **sb, pm**  
 151. **Rock Sparrow** *Petronia petronia* **R**  
 152. **Chaffinch** *Fringilla coelebs* **R, PM, WV**  
 153. **Brambling** *Fringilla montifringilla* **pm, WV**  
 154. **Red-fronted Serin** *Serinus pusillus* **PM**  
 155. **Serin** *Serinus serinus* **pm, WV**  
 156. **Syrian Serin** *Serinus syriacus\** **R, pm, wv**  
 157. **Greenfinch** *Carduelis chloris* **SB, PM, WV**  
 158. **Goldfinch** *Carduelis carduelis* **r, WV, pm**  
 159. **241. Siskin** *Carduelis spinus* **pm, wv**  
 160. **Linnet** *Carduelis cannabina* **R, WV, PM**  
 161. **Crimson-winged Finch** *Rhodopechys sanguinea* **r**  
 162. **Hawfinch** *Coccothraustes coccothraustes* **pm, wv**  
 163. **Yellowhammer** *Emberiza citrtnella* **WV**  
 164. **Rock Bunting** *Emberiza cia* **R**  
 165. **Ortolan Bunting** *Emberiza hortulana* **sb, PM**  
 166. **Cretzschmar's Bunting** *Emberiza caesia* **sb, pm**  
 167. **Black-headed Bunting** *Emberiza melanocephala* **SB, PM**  
 168. **Corn Bunting** *Miliaria calandra* **r, PM**

**ANNEX 4: List of herpetofauna of Al-Chouf Cedar.**

1. refers to globally threatened species
2. refers to regionally threatened species
3. refers to endemic species
4. refers to nationally rare species

<i>SCIENTIFIC NAME</i>	<b>English Name</b>	<b>Arabic Name</b>
<b>SALAMANDRIDAE</b>		
<i>Salamandra infraimmaculata</i> <i>infraimmaculata</i> (2)	<b>Fire Salamander</b>	سلمندر
<b>BUFONIDAE</b>		

<i>Bufo viridis</i> (2)	<b>Green toad</b>	علاجوم أخضر
<b>RANIDAE</b>		
<i>Rana levantina (Bedriagae)</i> (2)	<b>Levant frog</b>	ضفدع شرقي
<b>HYLIDAE</b>		
<i>Hyla savignyi</i> (2)	<b>Common tree-frog</b>	ضفدع الشجر
<b>TESTUDINIDAE</b>		
<i>Testudo graeca terrestris</i> (2)(4)	<b>Tortoise</b>	سلحفاة برية
<b>GEKKONIDAE</b>		
<i>Hemidactylus turcicus turcicus</i> (2)	<b>Turkish gecko</b>	أبو بريص
<i>Cyrtopodion kotschy orientalis</i> (2)	<b>Tree gecko</b>	أبو بريص الشجر
<i>Cyrtopodion amictopholis?</i> (4)	?	?
<b>CHAMAELEONIDAE</b>		
<i>Chamaeleo chamaeleon restricta</i> (1) (2) (4)	<b>Chameleon</b>	حرباء
<b>AGAMIDAE</b>		
<i>Laudakia stellio stellio</i>	<b>Agama</b>	حرذون
<b>LACERTIDAE</b>		
<i>Lacerta laevis laevis</i> (2)	<b>Wall lizard</b>	سحلية الحيطان
<i>Lacerta media wolterstorffi</i> (3)	<b>Green lizard</b>	سحلية خضراء
<i>Ophisops elegans</i>	<b>Snake-eyed lizard</b>	سحلية أنيقة
<b>SCINCIDAE</b>		
<i>Ablepharus budaki budaki</i>	<b>Little skink</b>	سقتقور صغير

<i>Mabuya vittata</i>	<b>Vital's skink</b>	سقفور حيوي
<b>TYPHLOPIDAE</b>		
<i>Typhlops vermicularis</i>	typhlops	ثعبان الأزهار
<b>COLUBRIDAE</b>		
<i>Platiceps najadum dahlia</i> (2)	<b>Small whipe snake</b>	أفعى نشابيه
<i>Eirenis lineomaculatus</i>	?	?
<i>Elaphe hohenackeri</i>	?	?
<i>Elaphe sauromates</i> ? (4)	?	?
<i>Hierophis jugularis</i> (2)	<b>Large whipe snake</b>	أفعى كرجاجية
<i>Eirenis levantinus</i>		
<i>Malpolon monspessulanus insignatus</i> (2)	<b>Montpellier snake</b>	أفعى مونبلييه
<i>Natrix tessellata tessellata</i> (2)	<b>Dice snake</b>	أفعى الزهر
<i>Platiceps collaris</i>	<b>Collar snake</b>	ثعبان مطوق
<b>Viperidae</b>		
<i>Vipera palestinea?</i> (2)		
<i>Vipera lebetina?</i> (2)		
<i>Vipera bornmuelleri</i> (2) (3)		

**ANNEX 5: List and summary status of the observed insect specimens at Al-Chouf Cedar.**

\* denotes verified specimen through comparison with the Lebanese University collections.

Order	Family	Scientific name	density	abundance
Coleoptera	CicindellidaeFig32	<i>Cicindella sp</i>	low	Rare
Coleoptera	CarabidaeFig12	<i>Nebria hemprichi</i> (klug1832)	low	Rare
Coleoptera	CerambycidaeFig29	<i>Calamobius filum</i> (Rossi,1790)	*	
Coleoptera	Cerambycidae	<i>Phytoecia virgule</i> (Charpentier,1825)	*	
Coleoptera	Scarabeidae	<i>Oructeus nasicornis</i> (Linnaeus1758)	*	
Coleoptera	ScarabeidaeFig23	<i>Netocia vidua</i> (Gorg et Percheron)	*	
Coleoptera	ChrysomellidaeFig42		*	
Coleoptera	Hydrophilidae	<i>Haccobius syriacus</i> ()Guill	*	
Diptera	SyrphidaeFig46		medium	common
Diptera	BombyliidaeFig48		medium	common
Diptera	CalliphoridaeFig49		medium	common

Dictioptera	BlattidaeFig79		low	common
Hemiptera	LygaidaeFig51		low	Rare
Hemiptera	Lygaidae	<i>Lygaeus equestris</i> (Linnaeus1758)	*	
Hemiptera	Miridae	<i>Grypocoris</i> ( <i>Turciocoris</i> ) <i>syriacus</i> (Reuter, 1896)	*	
Hemiptera	Miridae	<i>Closterotomus putomi</i> (Horvath, 1888)	*	
Hemiptera	Miridae	<i>Lepidargyrus seidenstueckeri</i> (Wanger1956)	*	
Hemiptera	Miridae	<i>Dereocoris</i> ( <i>Camptobrochis</i> ) <i>serenus</i> (Douglas & Scott,1868 )	*	
Hemiptera	Miridae	<i>Pachyxyhus lineellus</i> (Mulsant & Rey 1852)	*	
Hemiptera	Lygaidae	<i>Lethaeus</i> <i>cribratissimus</i> (Stal,1858)	*	
Hemiptera	MiridaeFig60	<i>Euryopicoris nitidus</i> (Meyer- Dur,1843)	*	
Hemiptera	ScutellaridaeFig58	<i>Graphosoma italium</i> (Mull)	*	
Hemiptera	ScutellaridaeFig59	<i>Graphosoma melanoxanthum</i> (Horvath, 1903)	*	
Hemiptera	Pentatomidae	<i>Raphigaster nebulosa</i> (Poda,1761)	*	
Hemiptera	Pentatomidae	<i>Acrosternum</i> sp	*	
Hemiptera	Coreidae	<i>Camptotus lateralis</i> (Germar,1817)	*	
Hemiptera	Reduviidae	<i>Rhynocoris iracundus</i> (Poda,1761)	*	
Hemiptera	Reduviidae	<i>Sphedanolestes</i> <i>pulchelus</i> (Klug1830)	*	
Hemiptera			*	
Homoptera	Cicadidae	<i>Cercopis intermedia</i> <i>kirschbaum</i>	*	
Hymenoptera	Apidae Fig62		high	common
Hymenoptera	Apidae Fig63		medium	common
Hymenoptera	Apidae Fig64		medium	common
Hymenoptera	VespidaeFig67		Medium	Common
Hymenoptera	VespidaeFig68		Medium	Common
Orthoptera	Acrididae Fig72		Low	Rare
Orthoptera	Acrididae Fig73		low	Rare



**ANNEX 6:** The determination of the butterflies of Al-Chouf Cedar Reserve is the output of a combined effort that was exerted by all members of the team of experts when every time one butterfly is seen, photographed or described it was compared to the content of the plates that are offered by T. Larsen in his book “Butterflies of Lebanon” (1974).

The table below lists 51 species that were also reported from somewhere else.

<b>Butterflies of Al-Chouf Cedar Reserve</b>					
<b>No</b>	<b>Scientific Name</b>	<b>English Name</b>	<b>Sub-Family</b>	<b>Family</b>	<b>Place</b>
1	<i>Papilio alexanor maccabaeus</i>	Tiger Swallowtail	Papilioninae	PAPILIONIDAE	Ehden
2	<i>Allancastrias (Zerynthia) cerisyi speciosa</i>	Eastern Festoon	Parnassiinae	PAPILIONIDAE	Ehden , Jisr el-Qadi, Aammiq
3	<i>Allancastrias deyrollei eisneri</i>	Libanese Festoon	Parnassiinae	PAPILIONIDAE	Ehden , Ctoura

Butterflies of Al-Chouf Cedar Reserve					
No	Scientific Name	English Name	Sub-Family	Family	Place
4	<i>Parnassius mnemosyne syra</i>	Clouded Apollo	Parnassiinae	PAPILIONIDAE	Faraya, Ehden
5	<i>Pieris napi dubiosa</i>	Green-veined White	Pierinae	PIERIDAE	Ehden , Hammana , Antelias , sea level, Jbeil, Cedar Mountain, Hazmiye, Beirut
6	<i>Pieris ergane detersa</i>	Mountain Small White	Pierinae	PIERIDAE	Ehden , Barouk Cedar , Cedar Mountain ,
7	<i>Colias aurorina libanatica</i>	Dawn Clouded Yellow	Coliadinae	PIERIDAE	Cedar Mountain, Jabal Knisse, Ehden
8	<i>Gonepteryx rhamni meridionalis</i>	Brimstone	Coliadinae	PIERIDAE	Ehden, Aammiq
9	<i>Gonepteryx farinosa farinosa</i>	Powdered Brimstone	Coliadinae	PIERIDAE	Jabal Aitou
10	<i>Leptidea duponcheli xanthochroa</i>	Eastern Wood White	Dismorphiinae	PIERIDAE	Cedar Mountain, Jabal Aitou
11	<i>Fabriciana niobe philistra</i>	Niobe Fritillary	Nymphalinae	NYMPHALIDAE	Jabal Ijbeh
12	<i>Issoria lathonia lathonia</i>	Queen of Spain Fritillary	Nymphalinae	NYMPHALIDAE	Cedar Mountain, Ehden
13	<i>Melitaea cinxia clarissa</i>	Glanville Fritillary	Nymphalinae	NYMPHALIDAE	Ehden, Aammiq
14	<i>Melitaea collina collina</i>	Lederer's Fritillary	Nymphalinae	NYMPHALIDAE	Maaser es Chouf, Ehden
15	<i>Melitaea didyma libanotica</i>	Toadflax Fritillary	Nymphalinae	NYMPHALIDAE	Ain Zhalta Cedars, Dahr el-Baidar, Ehden, Nabi Sbat, Antiliban, Aammiq
16	<i>Melanargia titea titea</i>	Levantine Marbled White	Satyrinae	NYMPHALIDAE	Nahr Ibrahim, Jabal Kesrouan, Aammiq, Ehden
17	<i>Hipparchia alcyone syriaca</i>	Syrian Grayling	Satyrinae	NYMPHALIDAE	Barouk Cedars, Ehden
18	<i>Neohipparchia</i>	Freyer's	Satyrinae	NYMPHALIDAE	Ehden

Butterflies of Al-Chouf Cedar Reserve					
No	Scientific Name	English Name	Sub-Family	Family	Place
	<i>fatua sichaea</i>	Grayling			
19	<i>Pseudochazara telephassa telephassa</i>	Telephassa Grayling	Satyrinae	NYMPHALIDAE	Jabal Qammoua, Ain Zhalta, Ehden
20	<i>Pseudochazara pelopea pelopea</i>	Pelopea Grayling	Satyrinae	NYMPHALIDAE	Jabal Aitou, Aammiq
21	<i>Satyrus ferula makmal</i>	Great Sooty Satyr	Satyrinae	NYMPHALIDAE	Jabal Ijbeh, Aammiq
22	<i>Hyponephele lycaon libanotica</i>	Dusky Meadow Brown	Satyrinae	NYMPHALIDAE	Ain Zhalta Cedars, Aammiq, Ehden
23	<i>Hyponephele lupinus centralis</i>	Oriental Meadow Brown	Satyrinae	NYMPHALIDAE	Ain Zhalta Cedars, Jabal Aitou
24	<i>Kirinia roxelana roxelana</i>	Lattice Brown	Satyrinae	NYMPHALIDAE	Ehden
25	<i>Callophrys rubi intermedia</i>	Green Hairstreak	Theclinae	LYCAENIDAE	Ain Zhalta Cedars, Aammiq, Ehden
26	<i>Strymonidia ilicis bischoffi</i>	Ilex Hairstreak	Theclinae	LYCAENIDAE	Ehden
27	<i>Fixsenia ledereri nazeri</i>	Orange-banded Hairstreak	Theclinae	LYCAENIDAE	Ehden
28	<i>Quercusia quercus quercus</i>	Purple Hairstreak	Theclinae	LYCAENIDAE	Cedar Mountain, Ehden
29	<i>Tomares nogelii aurantiaca</i>	Turkish Vernal Copper	Theclinae	LYCAENIDAE	Ehden
30	<i>Tomares nesimachus nesimachus</i>	Syrian Vernal Copper	Theclinae	LYCAENIDAE	Ehden
31	<i>Lycaena (Lycaena) phlaeas timeus</i>	Small Copper	Lycaeninae	LYCAENIDAE	Jabal Barouk, Aammiq, Ehden
32	<i>Lycaena (Thersamonia) asabinus asabinus</i>	Lesser Purple-shot Copper	Lycaeninae	LYCAENIDAE	Ain Zhalta Cedars, Jabal Barouk, Barouk Cedars, Ehden
33	<i>Lycaena (Thersamonia)</i>	Golden Copper	Lycaeninae	LYCAENIDAE	Barouk Cedars, Jabal Barouk, Ehden

Butterflies of Al-Chouf Cedar Reserve					
No	Scientific Name	English Name	Sub-Family	Family	Place
	<i>ochimus ochimus</i>				
34	<i>Lycaena (Thersamonia) thetis zahaltensis</i>	Fiery Copper	Lycaeninae	LYCAENIDAE	Ain Zhalta Cedars, Cedar Mountain, Jabal Aitou
35	<i>Lycaeides idas selda</i>	Idas Blue	Plebejinae	LYCAENIDAE	Jabal Kesrouan, Cedar Mountain, Ehden
36	<i>Plebejus pylaon nichollae</i>	Zephyr Blue	Plebejinae	LYCAENIDAE	Ain Zhalta Cedars, Cedar Mountain, Ehden
37	<i>Eumedonia eumedon mylitta</i>	Geranium Argus	Plebejinae	LYCAENIDAE	Cedar Mountain, Ehden
38	<i>Aricia isaurica dorsumstellae</i>	Isaurica Blue	Plebejinae	LYCAENIDAE	Faraya Mzar, Ehden, Cedar Mountain
39	<i>Aricia ? Crassipuncta bassoni</i>	Steely Argus	Plebejinae	LYCAENIDAE	Jabal Qammoua, Ehden
40	<i>Cyaniris antiochena antiochena</i>	Eastern Mazarine Blue	Plebejinae	LYCAENIDAE	Mdairej, Ehden, Jabal Qammoua, Aammiq
41	<i>Lysandra isauricoides isauricoides</i>	Baby Blue	Plebejinae	LYCAENIDAE	Cedar Mountain, Ehden
42	<i>Lysandra ellisoni ellisoni</i>	Cedar Mountain Blue	Plebejinae	LYCAENIDAE	Cedar Mountain
43	<i>Lysandra thersites gravesi</i>	Chapman's Blue	Plebejinae	LYCAENIDAE	Cedar Mountain, Ehden
44	<i>Lysandra (Plejus) loewii antilibanotica</i>	Loew's Blue	Plebejinae	LYCAENIDAE	Ain Zhalta Cedars, Cedar Mountain, Aammiq, Ehden
45	<i>Lysandra syriaca syriaca</i>	Lebanese Adonis Blue	Plebejinae	LYCAENIDAE	Jabal Qammoua, Naba el-Aasal, Ehden
46	<i>Glaucopsyche alexis aeruginosa</i>	Green Underwing Blue	Glaucopsychinae	LYCAENIDAE	Ehden
47	<i>Turanana panagaea panagaea</i>	Odd-spot Blue	Glaucopsychinae	LYCAENIDAE	Jabal Aitou

Butterflies of Al-Chouf Cedar Reserve					
No	Scientific Name	English Name	Sub-Family	Family	Place
48	<i>Pyrgus armoricanus philonides</i>	Oberthur's Grizzled Skipper	Pyrginae	HESPERIIDAE	near Faraya, Faraya Mzar, Ainata, Aammiq, Ehden
49	<i>Spialia phlomidis kiki</i>	Kiki's Skipper	Pyrginae	HESPERIIDAE	Jabal Kesrouan, Cedar Mountain, Ehden
50	<i>Carcharodus stauderi ambigua</i>	North African Skipper	Pyrginae	HESPERIIDAE	Cedar Mountain, Ehden
51	<i>Pelopidas thrax thrax</i>	Millet Skipper	Hesperiinae	HESPERIIDAE	Ehden

#### ANNEX 7 Methodology and criteria for the selection of species

A methodology to limit the study of flora and fauna to a number of species that demonstrates the ecological interest of the site was drawn upon literature and existing data surveys, taking into account the needs of on-going conservation programs and the practical availability of biodiversity datasets. It consisted of evaluating the state and trends of biological diversity at the species level. Recognizing the substantial limitations with regard to the current level of information and details of existing Lebanese data at the species-site level, the working research group suggested a methodology which requires the implementation of three different phases of analysis modules:

- "**Coarse filter**" analysis: this phase selects the species that are globally threatened, regionally threatened, nationally threatened, endemic, rare species and noteworthy (keystones, flagship species, indicators, medicinal species, alien invasive species and species of special concern), where:

**Endemic species:** is limited only to the site (endemic to the site), to the country (endemic to Lebanon), to the region (endemic to the Middle East, Levant region or East Mediterranean Region).

**Rare species:** is rare in the area and at national level.

**Noteworthy species:** is a species of special interest: economic value, cultural value for local people, medicinal plants, aromatic plants, fodder plants, wild-relative plants, dominant plants, very abundant species, introduced species (see below Alien), pest species, etc.

**Threatened species:** is threatened according to national, regional and/or international Red data lists.

**Alien species:** is exotic or introduced (purposely or accidentally) invasive or potential invasive species (Alien are also considered Noteworthy).

- **"Mid-coarse filter"** analysis: this second phase checks the species that are selected in the previous phase in term of vulnerability and accessibility. For example, a globally threatened species that is protected in its distribution range and occurs accidentally in a study site is of lower significance than another globally threatened species found to be limited in its distribution to this site. However, it is worth to note that the identification of the species that is in most need of conservation action can also be done by monitoring the numbers and distribution of the species in question. In this phase, it is preferable to only deal with the most endangered, locally or nationally rare, endemic, and noteworthy species.

- **"Fine filter"** analysis: this third phase addresses the requirements of the species of the "mid-coarse filter" that are considered to be of special management significance; mainly in relation to the study site (the hypothesis calling for the need to often protect the species beyond the limits of the site is recognized).

#### **A.1.5.1.2 Criteria for species selection**

The process used in the filter modules at the first progress level to limit the number of the selected species is based on literature and other collected data which are far from being sufficient. The selected species are then reviewed on the light of consultant team – management teams meetings, compilation of baseline information on the selected or target species, assessment of threats, information about utility, and verification of their status and their populations' level during the field work. Having in mind that the list of the selected species is not final and recognizing that there may be many species which would be of high importance and be significantly threatened to warrant inclusion in the project, the target species will remain under a fine tuning process according to the following selection criteria for specific species which intend to select species carefully that have the highest priority in terms of their value to people and environment, but at the same time considering their amenability to in situ conservation and monitoring with respect to ecosystem approach, representativeness of the study sites, utility and complementarities between the different protected areas:

**Criterion 1: Status of Threat:** a list of all species that are threatened at global, regional, national and local levels as well as the endemic and rare species is to be drawn up and be a part of the coarse filter.

**Criterion 2: Environmental Importance:** a list of all species that are noteworthy such as the keystones, flagship species, bio-indicators, medicinal, alien invasive species and other species of special or economic importance is also to be drawn up and be part of the coarse filter.

**Criterion 1.2: Level of Threat:** under this criterion, the list of species derived from the criterion 1 should then be prioritized as follows:

**1.2.1- International Priority:** threatened species of the IUCN Red List from critically endangered to near threatened through endangered and vulnerable are to be given high priority and subsequently included in the mid-coarse filter as the most threatened species.

**1.2.2- National Priority:** threatened species according to country inventories, including endemic species from regional to local through national endemism are to be given highest level of concern and subsequently included in the mid-coarse filter.

**1.2.3- Human Impacts:** species that are impacted by over exploitation, over collection, over use, persecution, pollution, drainage, over hunting, destruction or degradation of their habitats or lands, etc. are to be classified under second level of threat and be incorporated in the mid-coarse filter.

**1.2.4- Biotic Factors:** all species which are introduced, non native, alien invasive, heavy predators, pests, etc. are to be given third level of concern and be contained in the mid-coarse filter.

**1.2.5- Abiotic factors:** all species those are sensitive to habitat changes due to floods, drought, soil movement or erosion, etc. are to be classified under fourth level of threat and then be included in the mid-coarse filter.

**Criterion 2.1: Level of Environmental Importance:** under this criterion, the list of species derived from the criterion 2 should then be prioritized as follows:

**2.1.1- Economic Importance:** all species of direct use (single or multipurpose use) for food (edible plants, game birds, etc.), shelter (trees, commensalisms, symbiosis, etc.), firewood, etc. and all species of indirect use (single or multipurpose use) for providing products thereof such as oil, honey, genetic improvement (wild relatives), medicine, research tool, etc. are to be given highest value and be then incorporated in the mid-coarse filter.

**2.1.2- Environmental Services:** species which play a key role in the pollination, fixation of soil, forestation (Keystone species), ecological balance, maintenance of trophic chains

and webs, providing habitats for other biodiversity, etc. are to be given a second level of priority and be then contained in the mid-coarse filter.

**2.1.3- Educational Services:** all species which constitute a prominent educational value or attraction for researchers are to be given a third level of priority and should be included in the mid-coarse filter.

**2.1.4- Cultural & Traditional Value:** species which constitute a value for local needs such as Flagship species, related species to religion's beliefs, popular medicinal species, related species to superstitions, etc. are to be given a fourth level of priority and be included in the mid-coarse filter.

**2.1.5- Bio-indication Value:** all species that provide obvious bio-indication character should be given a fifth level of priority and be included in the mid-coarse filter.

**2.1.6- Socio-economic Value:** species which play a role in generation of incomes through different activities (bird watching, scuba diving, tree adoption, etc.) are to be given a sixth level of priority and be included in the mid-coarse filter.

**2.1.7- Potential Value:** all species that are identified to be of future value for investment, marketing, provision of genes, medicine, etc. are to be considered and given a seventh level in the mid-coarse filter.

**Criterion 3: Conservation Significance:** all species that are selected using the criteria 1.2 and 2.2 for inclusion in the mid-coarse filter are to be subjected to a scoring approach in which the species attaining highest scores (points are optional and in correlation with the levels of threats and importance) are to be retained by the fine-filter, provided they respond to the following sub-criteria:

**Criterion 3.1: Global & Regional Strategies:** all species for which the conservation and monitoring contribute to the global or regional strategies on biodiversity conservation are to be placed on the highest rank of priorities.

**Criterion 3.2: Sustainability Consideration:** all species of likelihood of sustainable conservation success are to be ranked at the second level of priorities.

**Criterion 3.3: Uniqueness Consideration:** all species that are strictly limited to the study site are given the third rank of prioritization. Species which are of conservation value but covered in other sites are omitted for duplication avoidance.

**Criterion 3.4: Accessibility Consideration:** all species that are of no easy access are to be given the lowest scoring points. They mainly include vagrant, erratic and occasional species; species for which the conservation is not dependant on the study site, etc. Species of equal qualifications but of lowest accessibility are of lowest priority.



Finally and due to the complexity of the selection criteria' application to the potential species, the fine-filter species list was preferably drawn up in consultation with relevant stakeholders, mainly the local management teams.

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