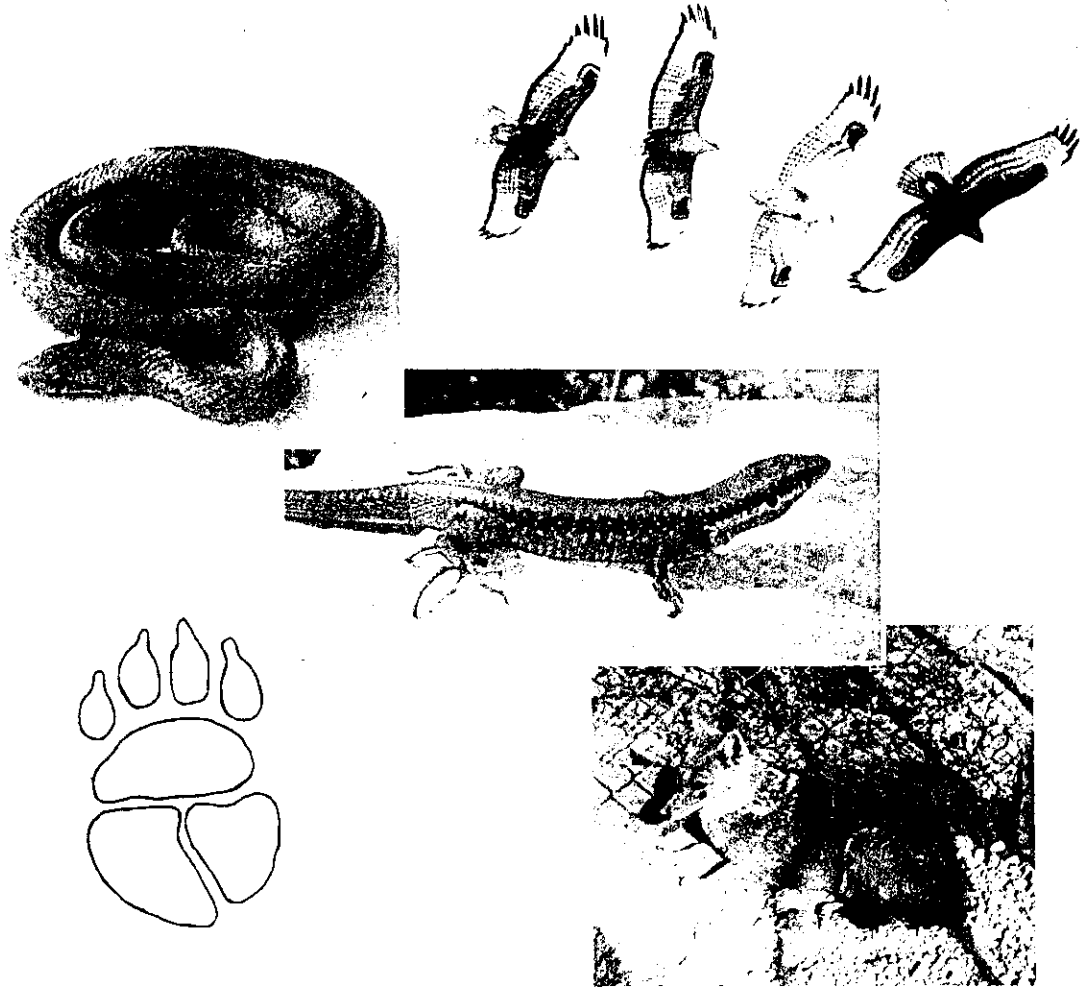


PROTECTED AREAS PROJECT

AL SHOUF CEDAR - HORSH EHDEN - PALM ISLAND
NATURE RESERVES

**FAUNA MONITORING MANUAL
PART II**



Ghassan Jaradi, Ph.D.

Riad Sadek, Ph.D.

Mounir Abi Said, M.Sc.

Birds

Reptiles and Amphibians

Terrestrial Mammals

الجمهورية اللبنانية
 مكتبة وزير الدولة لشؤون التنمية الإدارية
 مركز مشاريع ودراسات القطاع العام

GREEN LINE ASSOCIATION

Copyright © 2000
All Rights Reserved



TABLE OF CONTENTS

SECTION I: Bird Monitoring Methods

Single species methods of bird monitoring/wintering	I - 1
Single species methods of bird monitoring/breeding	I - 3
Potential Nest Sites Record Sheet	I - 10
Site Occupancy Record Sheet	I - 11
Generic breeding bird monitoring methods	I - 12
Common Birds Census (CBC)	I - 12
Breeding Bird Survey (BBS)	I - 15
BBS Field Recording Sheet	I - 17
BBS Count Summary Sheet	I - 18

SECTION II: Monitoring of Amphibians and Reptiles

Approaches to Monitoring	II - 1
Recording Data	II - 1
Collection and Preservation of Specimens	II - 2
Amphibians	II - 4
Reptiles: Turtles and Tortoises	II - 6
Reptiles: Lizards	II - 8
Snakes: Colubridae	II - 13
Snakes: Viperidae	II - 16

SECTION III: Monitoring of Terrestrial Mammals

<i>Canis aureus syriacus</i>	III - 1
<i>Vulpes vulpes palaestina</i>	III - 2
<i>Sus scrofa lybicus</i>	III - 2
<i>Felis chaus</i>	III - 3
<i>Hyotrix indica indica</i>	III - 4
<i>Hyaena hyaena syriaca</i>	III - 4
<i>Meles meles canescens</i>	III - 5
Foot prints	III - 6

DR. GHASSAN JARADI

We thank the **Royal Society for the Protection of Birds**/partner of **Bird Life International** in Britain, copyright owner of the book *Bird Monitoring Methods*, for using parts of their work, for the preparation of this manual.

BIRD MONITORING METHODS

Single species methods of bird Monitoring/ wintering

CORMORANT

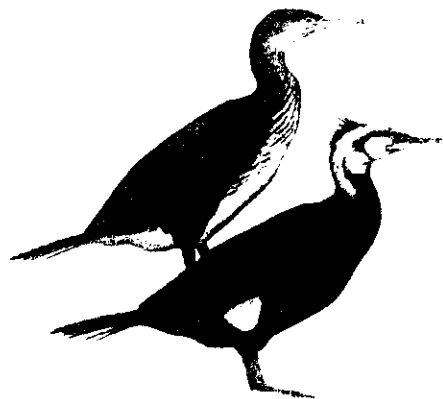
Phalacrocorax carbo

Status

wv, pm,s

Known population and distribution

Taking into account increases in wintering numbers, Lebanon populations now probably number in excess of 400 wintering birds.



Winter monitoring

The time of the day for counts of cormorants is important. In general, best winter counts are obtained when birds are not at feeding time, but around three hours after sunrise when birds have just completed their early-morning feeding and have hauled out to loaf and dry their wings. However the timing differs with habitat, season and site, so, if possible, counters should conduct preliminary visits to sites to identify the best times to count. On estuaries, feeding rhythms may be determined by tidal cycles (eg birds feeding mainly at high tide) and peak counts may occur some time before or after high tide.

Christmas week survey

Only few bird roost-sites have been identified near Baqar islet of El Mina. Coordinated roost counts bring better total population ideas than do daytime counts and they may therefore be a more suitable method for population estimation.

Information required

- Number of birds

Number and timing of visits

One visit on a single date during the last week of December or the first week of January. For future surveys, a preferred date within this period should be set.

Time of day

Dusk. Observers should be present at roosts about one hour before dark to ensure that all birds entering roosts are recorded.

Sites/ areas to visit

All known roost-sites

Safety reminders

Particular attention should be paid to coastal cormorant roosts, access to which may be dangerous in winter, especially in cold temperatures and high winds.

Disturbance

None necessary

Methods

Count all birds present at each roost as they arrive at the roost; light conditions will begin to deteriorate with the onset of dusk. If possible, the number of birds with white bellies (first-year *p.c.carbo*) should also be recorded. Notes should also be made of any color-ringed birds that are observed, including whether the ring is on the left or the right leg, the color of the ring and the direction in which the inscription reads (up or down the leg). Even incomplete details are useful and are usually sufficient to identify the colony of origin and/ or the year of ringing.

If the survey method is extended to include a further two visits, the Christmas week mid-winter count will remain the highest priority. If inclement weather conditions are experienced during a roost count, the count should be repeated at the earliest opportunity.

References

- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). *Bird Monitoring Methods*. RSPB, Bedfordshire. UK.
- Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1997).-Notes on some breeding birds in Lebanon. *Sandgrouse* , 19 (2): 122-125.
- Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1999).- An updated Checklist of the Birds of Lebanon. *Sandgrouse*, 21 (2): 132-170.

Single species methods of bird Monitoring/ breeding

LONG LEGGED BUZZARD

Buteo rufinus

Status

R, pm, wv

Population and distribution

Breeding confirmed in spring 1995 and 1996 (Ramadan-Jaradi & Ramadan-Jaradi 1997), and spring 1997 (GRJ).



Present year-round with largest numbers in spring (March–April) and to a lesser extent in autumn (September–November). Uncommon in winter from November–early March in most of the country, being most frequent in central Beqaa.

The present distribution is linked with several factors, mainly persecution and pollution. There are an estimated 40 territories in Lebanon.

Ecology

Linked with a variety of landscapes including woodlands, (amidst pasture, meadow, arable or wetland), cultivated landscapes, with scattered trees, and hilly slopes, ridges with some tree cover. The LLB prefers hunting over open tracts of land with low vegetation, but nests in trees or on rocks. A diverse diet enables it to use a wide variety of habitats in which some kind of prey is abundant and accessible. A clutch of 2-4 eggs is laid from early April and most pairs will have full clutches by mid-April. Hence incubating females are unlikely to be seen soaring during April.

Breeding season survey-population

This method is used to estimate local densities and to estimate the change in numbers from year to year. The methods are designed to obtain fairly crude estimates of population size over an area with little time spent in the field in any particular area.

Information required

- Maximum number of soaring buzzards seen on any one visit per tetrad (2 x 2 km)
- Map showing the boundary of the survey area and the locations of soaring birds.

Number and timing of visits

One visit in March. A minimum of 1 hour (preferably two) must be spent in each tetrad.

Weather constraint

Counts should be carried out in good soaring conditions (ie. Dry, cloud cover less than 50%, wind speed less than 45 km/h. If such conditions are rare in March, try to avoid counting in wet, misty or windy conditions.

Sites to visit

Any suitable site (see ecology above).

Equipment

1:25,000 map

Safety reminders

No specific advice

Disturbance

This survey will not disturb buzzards

Methods

Mark the boundary of the survey area on to a map and split it into tetrads (2 x 2km). Cover the whole of the area searching for soaring buzzards. This does not require great expertise and can be carried out from roadsides or public footpaths. The best way of surveying a tetrad will depend on local topography, but often a single vantage point offering good all-round visibility will suffice. In hilly or well-wooded areas, it will probably be necessary to find two or more survey points to obtain a reliable estimate. Buzzards can soar to great heights and move large distances in a short time, and this needs to be taken into account when carrying out soaring surveys. Movements of soaring birds between tetrads should be marked on to the map and taken into account when analyzing results. Separate groups of soaring buzzards should be indicated by dotted lines between the groups. Solid lines should represent movements of individual birds between tetrads.

Report the maximum number of soaring LLBs seen in each tetrad (relate this to the map) on a single visit, but make allowances for birds seen to move between tetrads (ie ensure they are not counted twice). Report the density as the mean number (\pm standard error) of soaring buzzards per tetrad visited.

References

- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). *Bird Monitoring Methods*. RSPB, Bedfordshire. UK.
- Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1997).-Notes on some breeding birds in Lebanon. *Sandgrouse* , 19 (2): 122-125.
- Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1999).- An updated Checklist of the Birds of Lebanon. *Sandgrouse*, 21 (2): 132-170.

YELLOW LEGGED GULL

Larus cachinnans

Status

R, PM, WV, S

National monitoring

Avifauna of Palm Islands Reserve from 1893 to 1998 (*in press*)

Population and distribution

Resident breeder (eggs late April) in small numbers on Palm, Ramkine and Sanani islands (c. 70 pairs), off Tripoli (Ramadan-Jaradi & Ramadan-Jaradi 1997). Fairly common passage migrant in March–mid-May and mid-August–early November, a relatively common winter visitor in mid-November–late February, and not uncommon non-breeding summer visitor in May–July.

The YLG shows an increasing population on Palm Islands after a decrease in population levels between 1985 and 1993.

Ecology

YLGs breed on open rocks, often sloping sites on the ground, but also on cliff-ledges and increasingly on flat roofs of old houses (light house). They are colonial and lay a clutch of three eggs from late April. Incubation lasts 28-30 days, with young fledging 35-40 days after hatching and becoming independent soon after.

Breeding season survey-population and productivity

Gull population and productivity monitoring are outlined in the generic survey methods section.

Reference

- Gillian Gilbert, David W Gibbons and Julianne Evans (1998). *Bird Monitoring Methods*. RSPB, Bedfordshire. UK.
- Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1997).-Notes on some breeding birds in Lebanon. *Sandgrouse* , 19 (2): 122-125.
- Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1999).- An updated Checklist of the Birds of Lebanon. *Sandgrouse*, 21 (2): 132-170.



BARN OWL

Tyto alba

Status

r

Population and distribution

Widespread but local resident in small numbers, breeding from sea-level to high mountains and the Bèqaa valley (chicks from mid-April). Perhaps more widespread than records suggest.



Ecology

Largely nocturnal and crepuscular, barn owls roost in trees as well as buildings, and are sedentary. The main habitat requirement is the presence of rank tussocky grassland containing voles, the barn owl main prey. Permanent grassland, hay meadows and the grass edges of fields all provide good habitat for voles, mice and shrews and are therefore good hunting areas for barn owls. Woodland edges are also favoured, as are hedgerows, river banks, sea walls, ditches and dykes. Other sites may be used are golf courses, parkland, areas of scrub or waste ground, or road verges. A clutch of 4-7 eggs is laid in April, with larger clutches being produced when prey is especially abundant. Incubation lasts 29-34 days. The young leave the nest-site at about 60 days and they disperse up to 20 km from the nest (*Red Data Birds*).

Breeding season survey-population

Information required:

- Number of potential barn owl breeding sites.
- Number of these sites found to be occupied by barn owls.
- A map showing potential and occupied nest-sites.

Number and timing of visits

At least two visits: one between November and January, and the other between 1 June and 15 July. Extra visits will probably be required.

Time of day

Winter visit: any time of the day. Summer visit: preferably late afternoon.

Weather constraints

Do not survey if the weather is bad (eg rain, snow or wind). Watching a site for birds emerging or returning is best done on cloudless still nights.

Sites/ areas to visit

All potential sites in any areas of suitable habitat. There is no need to search in build-up areas or dense woodland, except at the periphery.

Equipment

- 1: 10000 map of the survey area
- recording forms.

Safety reminders

Work in teams at night where possible and always tell someone where you are going and when you expect to return. Keep away from farm machinery and chemicals. It is essential that you wear goggles/ face protection when inspecting nest-holes. Only climb trees when strictly necessary, always use a ladder and ensure that you are accompanied. Remember, hay bales may move and can be dangerous; do not attempt to move them.

Disturbance

During winter months barn owls may struggle to survive. If you suspect that a barn owl is present at a particular site, do not flush it out, but simply record the site. A barn owl disturbed in daylight may be mobbed by other birds and will be reluctant to return to the site. The winter fieldwork must be completed by the end of January to avoid possible disturbance to tawny owls which may be incubating eggs or even brooding small young during February (Taylor 1991). Do the minimum necessary to prove breeding has occurred or been attempted. At potential nest-sites look for signs of occupancy, then carry out a site watch. Only after these procedures fail to confirm or refute breeding should you inspect the nest-site.

Methods

Mark the boundary of the survey area on the map. Outline and hatch any areas which were deemed unsuitable and not searched.

The survey periods have been carefully chosen to maximize the chances of breeding owls being found and to minimize the risk of disturbance (Percival 1990), so please adhere to them.

Winter visits

Systematically search for all suitable potential nest sites in buildings, trees, bale stacks, etc, in the survey area and mark all those found on the field map with an X. Record every suspect site, ie every tree with a suspected suitable cavity or nest-box; every building with possible ledges, crevices or nest-boxes; every hay-bale stack (even though they may not be there later in the year), and all quarries and cliff-faces. Count each tree as a single potential site. However, several farm buildings grouped around a yard should be classified as a single site.

Potential buildings

Hay lofts and ledges, the tops of walls, the ends of roof beams and gaps in walls are all worth checking for pellets and feathers. Gaps in walls, even half-brick-sized holes leading into cavities may be used, as may ventilation and ducting tubes, storage bins and old water tanks in roofs. In old/ derelict houses, the loft space and cavities alongside chimney breasts are favoured, as is space under floorboards or corners of upper rooms. Barn owls may inhabit buildings occupied by people or animals, eg grain stores or milking parlours.

Nest-boxes

These may be on beams inside agricultural buildings, on exterior walls or tele-poles, or up in trees (any tree is suitable).

Potential trees

Barn owls generally favor isolated trees in fields or parkland, along hedgerows or roadside verges. Dense woodland can be excluded from the search as there are unlikely to be any barn owls present, but check up to three trees in from the edge or along a ride. Large cavities in the main trunks of deciduous trees are favored. Any tree trunk with a diameter less than 45 cm can normally be disregarded. Entrance holes can be quite small (15 cm) but often lead into cavities with large chambers. Short, squat, dumpy-looking trees with bulbous cavities are ideal candidates. The entrance holes are an average of 4.5 m above ground. If any of the trees you check is a potential site, record it and check in June.

Bale stacks

All hay-bale stacks should be recorded as potential nest-sites.

Cliff and quarry sites

A very few barn owls nest on heavily ridged or creviced cliff or quarry faces. Record these as potential sites.

Only record any known roost-sites if they qualify as potential nest-sites. Make extra visits to the survey area if necessary; eg if the area is large and/ or complex.

Complete the potential nest-sites recording sheet (figure 1). There is room to fill in totals for up to four visits to the site, but the overall total number of potential nest-sites of each kind is the most important information to record. Copy the total numbers of potential nest-sites of each kind onto the summer visit occupancy recording sheet (figure 2).

Summer visit

At each potential nest-site, look for signs of barn owl presence. These may be pellets, feathers or white splashing. You may see barn owls in the area but not know where they are nesting, or you may hear about sightings by local people. In all these cases, it is necessary to watch for barn owls at dusk. Get into position an hour before sunset and watch until an hour after sunset. At potential nest-sites with signs of barn owls, watch for the birds emerging or entering the site. If barn owls are seen in the area but you do not know where they may be nesting, watch near where they are seen, follow them or plot their direction of travel on a map and locate possible nest-sites along this path.

At any dusk watch, if you see an adult bird carrying prey to the nest (birds may carry prey to both nest- and roost-sites), or hear the hissing and snoring noises of the young owlets (sometimes heard some distance away), count this as a breeding site and do not approach it any more closely.

If you do not see any signs of barn owls near a potential nest-site, or during a dusk site watch, you will have to inspect the site. Remember, you should have a license to do this and always wear goggles or face protection.

Buildings and nest-sites

Checking is best done by two people. One person should enter the building by the safest route and the other should stand about 10 meters away, watching for any bird to fly out. Do not deliberately flush birds out; if at all possible, watch the site from a distance. If you do have to look inside a confined nest space, always wear goggles or face protection. Stay as quiet as possible; only one person should approach the site and they should be as quick as possible. If barn owls are seen, if the site contains a carpet of barn owl pellets, or if the the visible remains of round white eggs or young are found, count it as breeding site.

The map filled in during the winter visits will show all potential nest sites (X). Mark on this the sites which showed signs of barn owl presence (@), which were breeding barn owl sites (●) and which were sites lost or destroyed during the survey (■). Fill in the barn owl site occupancy recording sheet (figure 2). Copy over the number of potential nest-sites noted in each category in the winter (from figure 1) into the "Total sites" column of figure 2. Record the number of each type of site occupied by barn owls (and all other bird species too). Calculate how many of each type of site were unoccupied. Sum each column and record the totals in the bottom line.

Report the number of breeding pairs of barn owl as the total number of occupied barn owl nest-sites found.

References

- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). *Bird Monitoring Methods*. RSPB, Bedfordshire. UK.
- Percival, SM (1990) Population trends in British barn owls *Tyto alba*, and tawny owls *Strix aluco*, in relation to environment change. *BTO Research Rep.* 57.
- Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1997).-Notes on some breeding birds in Lebanon. *Sandgrouse* , 19 (2): 122-125.
- Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1999).- An updated Checklist of the Birds of Lebanon. *Sandgrouse*, 21 (2): 132-170.
- Taylor, IR (1991) Effects of nest inspections and radiotagging on barn owl breeding success. *J. Wildlife Management* 55: 312-315.
- Toms, M (1995) *Project Barn Owl 1995: fieldwork instructions; information sheets and recording sheets*. A BTO/ Hawk and Owl Trust Collaboration. BTO, Norfolk.

Name _____ Tele: _____ 10km square: □□□□ Tetrads: □
 Address: _____ Year: _____

Please record the number of potential barn owl nest sites of each type found in each 1 km of the tetrad. Copy these totals onto the site occupancy record sheet (summer survey).

(1) Site type		(2) No. of sites in each 1 km square of the tetrad				(2) Total no. of sites
		NW	NE	SW	SE	
Building						
Agricultural/ used	AU					
Agricultural/ disused	AD					
Agricultural/box in building	AN					
Bale stacks in building	BB					
Industrial/ used	IU					
Industrial/ disused	ID					
Industrial/ box in building	IN					
Domestic/ used	DU					
Domestic/ disused	DD					
Domestic/ box in building	DN					
Church/ used	CU					
Church or ruins/ disused	CD					
Military/ disused	MD					
Box in other building	MO					
Other (sites)						
*						
*						
Tree cavity						
Cedar	TC					
Oak	TO					
Ash	TA					
Fir	TF					
Tree nest box	TN					
*						
*						
Other structure						
Bale stack (outside)	BS					
Pole nest box	PB					
*						
*						
*						
(4) TOTAL						

Important Note: Copy column (1) details and column (2) totals onto the site occupancy record sheet ready for the summer survey. This will help you and others to check that the information has been correctly recorded.

Figure 1: Barn owl potential nest-sites recording sheet.

PROJECT BARN OWL

SITE OCCUPANCY RECORD SHEET

Name _____ Tele: _____ 10km square: □□□□ Tetrad: □
 Address: _____ Year: _____

Please record the occupancy of potential barn owl nest sites of each type found in each 1 km of this tetrad.
 Make sure that this sheet is included, by 15 September at the latest, in the data analysis.

(1) Site type	(2) Total sites				(3) No. of occupied sites				(4) Other species (state)		(5) No. of unoccupied sites			
					Barn owl									
	N	N	S	S	N	N	S	S	No.	1km	N	N	S	S
	W	E	W	E	W	E	W	E			W	E	W	E
Building														
AU														
AD														
AN														
BB														
IU														
ID														
IN														
DU														
DD														
DN														
CU														
CD														
MD														
MO														
*														
*														
Tree Cavity														
TC														
TO														
TA														
TF														
TN														
*														
*														
Other structure														
BS														
PB														
*														
*														
(6) Total														

Figure 2: Barn owl site occupancy recording sheet.

Generic breeding bird monitoring methods

Common Birds Census

The *Common Birds Census* (CBC), is based on survey method known as “territory mapping”. It has proved highly valuable in revealing population fluctuations and trends among birds and in helping to understand their causes. CBC data have played a key role in drawing up the listings of birds of conservation concern (Gibbons et al 1996). Territory mapping methods provide full site coverage, they require many visits and provide quality information. However, because of the time consuming nature of the fieldwork and the complex analysis required by the mapping method, an alternative scheme for national bird monitoring, the Breeding Bird Survey (BBS), has been developed. CBC will be continued in parallel with BBS for some time so that results from the two can be properly calibrated for national monitoring purposes.

Where a complex census of birds at a site during the breeding season is required, the CBC method is the most accurate and practical way. Some CBC guidelines are provided below (after Marchant 1983, Marchant et al. 1990, *Census Techniques*).

Information required

- number of territories of each species
- map for each species showing the registrations from all ten visits.

Number and timing of visits

Ten visits, March-July, ideally with at least ten days between each visit.

Time of day

Early morning. Avoid the first hour before sunrise. Up to two evening visits can be helpful.

Weather constraints

Avoid days of high winds (greater than Beaufort force 5) and poor visibility.

Sites/ areas to visit

CBC covers farmland and woodland but the methods can be adapted to most habitats.

Equipment

- 1:2500 OS map
- Clipboard.
- Two pencils.

Safety reminders

No specific advice.

Disturbance

Disturbance to birds is minimal

Methods

The size of the study plot will depend on the objective of the study. The area should be large enough to include sufficient numbers of any scarcer species of particular interest. A single visit should take 3-4 hours. In woodland with high bird densities, choose a plot of about 10-20 ha. On farmland, the plot should be about 50-100 ha depending on the number of hedges and woody areas. Be careful when choosing the boundaries of a plot; it is better to have plots that are roughly square or round, rather than ones which are long and thin or which have complicated edges. Using hedgerows as boundaries may be unavoidable but it exaggerates the density of birds on farmland, since the bulk of the birds are in the hedges. These edge effects become relatively less important the larger the area.

Map the boundary of the survey area. Take a new field map with you on each visit. Walk the area at a slow pace so that all birds detected can be identified and located. Choose a route which gets you to within 50 m of every point. Where vegetation is thick, a closer approach is desirable. Walk all hedgerows on farmland. Vary your route and direction between visits so that there is no systematic tendency for any part of the plot to be visited later or earlier in the day. Complete a single visit in a single morning.

Map the identity and activity of all birds with small and tidy writing in pencil or ball-point pen. Use standard codes for all species and behavior. Record as much detail as possible, such as the age and sex of each bird. The most important point to concentrate on is the location of individuals of the same species, which can be heard or seen simultaneously. Be sure to note on each visit map the visit, date, times, observer and weather.

When the visits have been completed, transfer all the information obtained from each species to a separate map, the "species map". Registrations on the species maps will fall more or less neatly into clusters indicating the activity of particular birds or pairs throughout the season. The maps can then be analyzed to determine the number of territories present.

A cluster is in general a spatially distinct group of registrations in which not more than one male and one female (or 2 adults) are represented. Depending on the biology of the species, it usually relates directly to a breeding territory. Ideal clusters show a series of registrations of territorial behavior spanning most of visits, and dotted lines radiating out to neighboring clusters. In practice, a small amount of confusion is to be expected, particularly for species such as tits and *Phylloscopus* warblers which are mobile and inconspicuous.

Some territories will overlap the plot boundary, so it is usually necessary to map records just outside the survey area. In the field, this translates as recording all birds up to 50 m outside the plot boundary in order to ensure that all territories straddling the boundary are mapped. Clusters are often difficult to differentiate and may sometimes overlap. As a consequence, map analysis can involve a certain amount of subjectivity in interpretation.

Report the number of territories of each species.

References

- Gibbons, DW, Avery, MI, Baillie, S, Gregory, R D, Kirby, J, Porter, R, Tucker, C and Williams, G (1996) Bird species of Conservation Concern in the United Kingdom,
- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). *Bird Monitoring Methods*. RSPB, Bedfordshire. UK.
- Channel Islands and Isle of Man: revising the Red Data List. *RSPB Conservation Review* 10:7-18.
- Marchant, JH (1983) *BTO Common Birds Census instructions*. BTO, Tring.
- Marchant, JH, Hudson, R, Carter, SP and Whittington, P (1990) *Population Trends in British Breeding Birds*. BTO, Tring.

Breeding Bird Survey

The *Breeding Bird Survey* (BBS) is introduced in breeding seasons as an annual survey of widespread and abundant birds. The BBS run in parallel with the CBC (see above). The BBS is a sample survey in which observers walk two 1-km transects within randomly allocated 1-km squares. The methods provide much more reliable information on national-wide population trends than does the CBC, although the BBS does not provide as detailed full census information at the plot level as does the CBC.

In terms of national population monitoring, the BBS will provide:

- Trends for many species for the country as a whole
- Trends for individual areas within the country
- Trends by habitat type
- Trends for Middle Eastern regions within Lebanon

In addition, the conservation of particular species and habitats will be greatly improved by a more complete understanding of the relationships between birds and broad habitat types, both of which are recorded by the BBS (Gregory et al 1996, 1997).

The BBS is not only a scheme, it is also a method. There are many circumstances in which using the line-transect method of the BBS may be the best way to monitor widespread and common breeding species in a particular area, even though these areas may not be within the formal sampling design of the BBS. In general, this would only work well for reasonably large sites, for example Environmentally Sensitive Areas (ESAs) or National Parks. In practice, such monitoring would probably be done by randomly selecting a sample of 1-km squares within the overall area, using the BBS method within each of these squares and repeating between years. Users of this approach should be warned that the analysis of the data collected using the BBS method can become quite complex and it is recommended that specialist advice is sought. This is particularly the case if the method is to be used to estimate absolute breeding densities and population sizes of individual species, rather than merely performing a between-year monitoring function. To estimate densities and population sizes it is necessary to use the distance sampling methods of Buckland et al (1993) and, ideally, the DISTANCE software specially written for such analyses.

Information required

- Number of individual birds (excluding juveniles) of all species that were recorded in each 200-m section of a two-km-long transect, in each of several distance bands, on each of two visits.

Number and timing of visits

Three: first visit March-April (set up route and record habitat); one between early April and mid-May (early transect count); one mid-May to late June (late transect count), The two count visits must be at least four weeks apart. NB Fieldwork should begin and end later in more northerly parts of Lebanon.

Time of the day

Morning, beginning ideally 6.00-7.00 AM and no later than 9.00AM.

Weather constraints

To not attempt to census in heavy rain, poor visibility or strong winds.

Sites/areas to visit

All accessible habitat types (except large expanses of water).

Equipment

- Recording forms (see figures 1 and 2)
- 1:50000 and 1:25000 maps of the area.

**BREEDING BIRD SURVEY
FIELD RECORDING SHEET**

Obs. code		Obs. name		Address	
1-km square reference					
County code				Tel. No:	
Visit date DD/MM/YY					
Early or late visit (E/L)			Weather		
First half	Start time (HH/MM)		Finish time		
Second half	Start time (HH/MM)		Finish time		

- Distance categories:
- 1** 0-25 metres from the transect line
 - 2** 25-100 metres from the transect line
 - 3** More than 100 metres from the transect line
whether within the 1-km square boundary or not
 - F** Birds in flight only (at any distance). Record
on sheet using arrows for direction.

100m 25m			25m 100m			100m 25m			25m 100m		
3	2	1	2	3	Distance category	3	2	1	2	3	
		⋮							⋮		
		⋮						⋮			
		⋮						⋮			
		⋮						⋮			
		⋮						⋮			
		⋮						⋮			
		⋮						⋮			
		⋮						⋮			
		⋮						⋮			
		⋮						⋮			
		⋮						⋮			
1	Start					2					

Figure 1: Example of a field recording sheet used for bird survey.

BREEDING BIRD SURVEY
COUNT SUMMARY SHEET

Obs. code		Obs. name											Address
1-km square reference												Tel. No:	
County code													
Visit date DD/MM/YY													
Early or late visit (E/L)		Weather											
First half	Start time (HH/MM)	Finish time											
Second half	Start time (HH/MM)	Finish time											
2 letters species code and species name	Distance category	No. of birds records on each transect section											
		1	2	3	4	5	6	7	8	9	10		
	1												
	2												
	3												
	F												
	1												
	2												
	3												
	F												
	1												
	2												
	3												
	F												
	1												
	2												
	3												
	F												
	1												
	2												
	3												
	F												

Figure 2: Example of a count summary sheet used for bird survey

Safety reminders

No specific advice

Disturbance

This method brings little disturbance to breeding birds

Methods

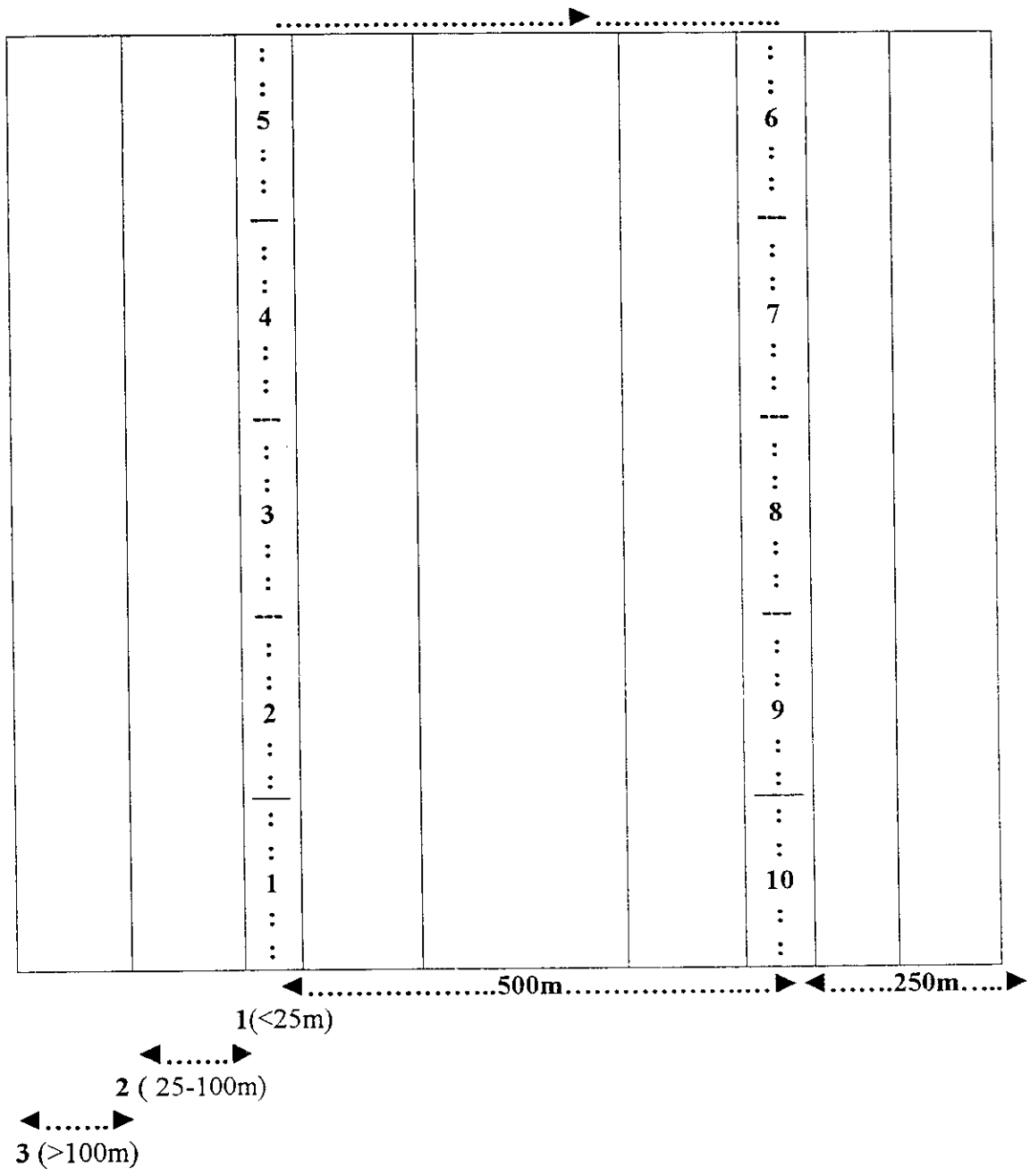
One may take a 1-km square or use BBS as a survey method and select randomly several tens of squares within the study area.

Map your transect route through each square. The transect route should consist of two parallel lines, north- south or east- west, each 1km long. It is important to use the same route each year. Transect lines should be 500 m apart and 250 m from the edge of the square. Each transect line should be divided into five equal 200-long sections, making a total of ten 200-m transect sections, numbered 1 to 10 (see figure 3). It is important to note the starting points of each transect either by using permanent landmarks or temporary markers. In practice, transect lines are likely to deviate from the "ideal" because of problems which access, or barriers such as roads, etc. However at no point should the two transect lines be less than 200 m apart. Minor intrusions into adjacent squares may be unavoidable. It is imperative that the same route be followed year after year.

From the chosen starting point, walk the first half of your transect route at a slow pace, pausing briefly at intervals to listen for song and to scan for birds flying overhead. Using the standard recording form (fig.1), record all birds seen and heard in the appropriate transect sections and distance categories (see below). At the end of section 5, stop recording, go to the start of section 6 and begin recording sections 6-10. Try to avoid double counting the same individual and distinguish adults from juveniles.

Record birds in one of the following four distance categories when first noted:

1. within 25 m either side of the transect line
2. between 25 and 100 m either side of the transect
3. more than 100 m either side of the transect line (including birds outside the 1-km square boundary)
4. birds in flight only (at any distance)



KEY

- ... ► ... Walking route
- 1, 2, 3,... Transect section number

Figure 3: Transect line route distances and numbered transect sections for a 1-km square for breeding bird survey.

Distances are measured perpendicular to the transect line. A bird seen 200 m ahead of the observer but within 25 m of the transect line should be recorded in category 1. To familiarize yourself with judging 25 m and 100 m distances, pace these out before starting the survey. For category F (Birds in flight), draw an arrow through the species' two letter code to indicate that it is in flight. If a bird is seen to take off or land it should be recorded in the appropriate distance category (1-3) at that position. NB skylarks in display flight should be recorded in the relevant distance category. Complete the summary sheets (Fig.2) as soon as possible after each field visit. Transfer the number of individuals (excluding juveniles) that were recorded in each section of the transect, 1-10, on each visit, in each distance band.

References

- Buckland, S T, Anderson, D R, Burnham, K P and Laake, J L (1993) *Distance sampling: Estimating Abundance of Biological Populations*. Chapman and Hall, London.
- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). *Bird Monitoring Methods*. RSPB, Bedfordshire. UK.
- Gregory, R D, Bashford, R I, Balmer, D E, Marchant, J H, Wilson, A M and Baillie, S R (1996) *The breeding Bird Survey 1994-1995*. BTO, Thetford.
- Gregory, R D, Bashford, R I, Balmer, D E, Marchant, J H, Wilson, A M and Baillie, S R (1997) *The breeding Bird Survey 1995-1996*. BTO, Thetford.

DR. RIAD SADEK

MONITORING OF AMPHIBIANS AND REPTILES

Required Tools

Fishing rod or pole with noose, snake handling devices (e.g. tongs), aquatic net, cloth bags, Binoculars, (advanced: computer database, digital camera).

Approaches to Monitoring

There are two approaches to monitoring of amphibians and reptiles. The first one is to monitor *populations* of these species directly and the other involves monitoring their *habitats*.

Monitoring populations could be applied to a limited number of “key” or “indicator” species. This often requires technical skills that will be needed to produce quantitative data. Such skills are usually not expected for the personnel of protected areas, who are also required to deal with so many other duties. Furthermore, the variety of ecological conditions that exist in the protected areas, especially Horsh Ehdén and Arz Al-Shouf, makes it particularly difficult to have one “key” species suitable for all, or most, of these different conditions. Considering these constraints, it will be more appropriate to collect qualitative data about several species, each of which can be an indicator of one or more ecological condition. This is the approach that will be recommended for this group.

Amphibians have been experiencing global decline for a variety of reasons. Amphibian species can be monitored directly using the above approach. Their population can also be monitored by monitoring their aquatic habitats. Some amphibians such as frogs require permanent water bodies. Others, e.g. salamanders, newts and toads, need such aquatic habitats only during the breeding season while in other seasons they are able to survive albeit in a dormant state away from these habitats. The availability of such habitats whether permanently or temporarily may be critical for their distribution and abundance.

Observation of populations can be made for some of the species listed below. You will find below a list of some of the species with pictures to aid in their identification. It may be possible to identify some species from a distance with the naked eye or with the aid of binoculars. You may need to capture some specimens for identification. Lizards can be captured using a *noose*. Snakes can be captured in a variety of ways but special care should be taken with venomous snakes (see list below for identification of vipers). Many lizard and snake species may eventually have to be chased and captured by hand. Gardening gloves are useful for this purpose. Specimens may then be identified and released unless there is a special reason to keep them. Amphibians and their larvae in the water may be captured using an aquatic net.

Recoding Data

Data about aquatic habitat distribution (e.g. ponds) may include location (GPS, compass readings or map coordinates), season, duration, altitude, presence of amphibians in and around the site, annual site tenacity (i.e. does it form and host amphibians every year).

In most cases, captured animals will be released back in the capture site. Some specimens of special interest may be collected. Note that some species may be readily identified from a distance. Many species, however, may require closer examination and sometimes by specialists which may include detailed study of scale patterns before confirming their identity. Collections of such specimens, in very limited numbers may be necessary. Special attention should be given to recording data in situations specified for each species in the list below under the item "Observations of special interest". For each observation made, whether a specimen is collected or not, the following data should be recorded:

- Species name (if known)
- Data type: live observation, live collection, dead specimen, molted skin, eggs etc
- Date
- Time
- Location (GPS readings, compass readings or map coordinates)
- Altitude
- Habitat type (forest, scrub, grassland etc)
- Substrate: e.g. water, snow, rock, stone, soil, gravel, aquatic vegetation, plant (mention type), wall etc.
- Activity: feeding, basking, escaping, fighting, mating
- Other data: color, size etc
- General comments

Collection and preservation of specimens

Any specimen found dead whether of amphibians or reptiles may constitute a useful piece of data. These specimens may eventually be used to build up a local museum collection. Mass fatalities or deformations in the amphibians collected should be reported.

Identification of species can be made not only from the animal specimen but also from other objects such as eggs and, in the case of snakes, from their shed skins. Tracks of turtles on nesting sites can also be used for identification of the turtles that made them.

Preservation of specimens can be achieved by one the following two methods:

- (1) 10% formalin (dilute 1 part 37% full strength formaldehyde solution in 9 parts of water)
- (2) Ethanol (Ethyl alcohol): 70-80% for reptiles and 65 % for amphibians.

The following pages show lists of the amphibians and reptiles most likely to be found in one or more of the protected areas of Lebanon, namely, Horsh Ehden, Arz Al-Shouf and Palm Islets. They DO NOT represent a comprehensive list that includes all the species found there but the ones that have been confirmed. The monitoring process will help in completing these lists both as baseline information and for future monitoring of changes.

For each of the species listed below the following information is provided:

Scientific (Latin) name:	Note that this name may change in the future as scientists make taxonomic revisions
Common name:	English and local Arabic names are provided as available
Adult size (approx.):	This is the approximate size in centimetres for the animal (usually without the tail)
Occurrence:	i.e. in which protected area
Status:	This will specify whether the species is abundant, endemic, threatened, rare etc
Altitude range:	Above sea level (in meters)
Habitat:	e.g. forest, pond, river, grassland etc
Preferred time of observation:	This will suggest the time when the animal is active and/or easier to detect and observe
Observations of special interest:	This is the most relevant item regarding monitoring because it will show the significance of the species this purpose and what sort of data is needed to signify some aspects regarding the monitoring process
Precautions for handling:	This item tells which animals may be dangerous (e.g. venomous snakes)
General information:	Various descriptions and relevant pieces of information are included here.

Relevant websites

<http://www.im.nbs.gov/>

AMPHIBIANS

Urodela

Salamandra infraimmaculata infraimmaculata

Common name: Fire Salamander, Arouset Al-Ain

Adult size (approx.): >20cm.

Occurrence: Horsh Ehden, Arz Al-Shouf

Status: abundant ?

Altitude range: 0 – 1500m (or higher?)

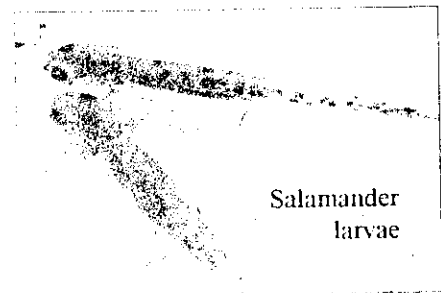
Habitat: damp woodland with aquatic habitats.

Preferred time of observation: evening, at night or when it rains

Observations of special interest: Any, including distribution of aquatic habitats; larvae.

Precautions for handling: glands on neck secrete toxic liquid.

General Information: may live away from water; comes to water for breeding; larvae remain in water until maturation. Adults in dry habitats remain in moist spots (under bark, stones and rocks) and come out in evening, at night or when it rains.



Anura

Bufo viridis

Common name: Green toad, Oljoum

Adult size (approx.):

Occurrence: Horsh Ehden, Arz Al-Shouf

Status: abundant

Altitude range: up to 2400m

Habitat: aquatic ; moist habitat

Preferred time of observation: any time.

Observations of special interest: Any, including aquatic habitat distribution; larvae.

Precautions for handling: glands on neck secrete irritating liquid.

General Information: males < females; tadpoles in water have a black color. Adults may be found near, or away from, water. During the dry periods adults stay under rock in moist spots.



Rana levantina

Common name: Common Green Frog, Dofdah

Adult size (approx.): 12-15 cm

Occurrence: Horsh Ehdén, Arz Al-Shouf

Status: abundant

Altitude range: up to 1500m(?)

Habitat: aquatic (ponds, calm parts of rivers)

Preferred time of observation: any time, (spring and summer).

Observations of special interest: altitude.

Precautions for handling: none

General Information: tadpoles in water have a brownish color; adults may be found only near water.



Hyla savignyi

Common name: Tree frog.

Adult size (approx.): 5 cm

Occurrence: Horsh Ehdén, Arz Al-Shouf

Status: abundant

Altitude range: up to 1500m(?)

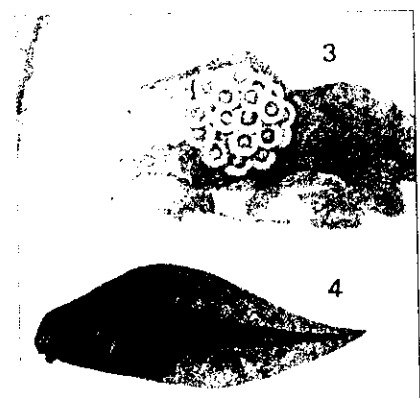
Habitat: moist areas; near water in breeding season, other times on trees.

Preferred time of observation: spring, summer and autumn

Observations of special interest: altitude, association with wooded areas.

Precautions for handling: none.

General Information:



REPTILES: TURTLES AND TORTOISES

Testudinidae

Testudo graeca terrestris

Common name: Tortoise; Sulhafate
Adult size (approx.): 28 cm
Occurrence: Horsh Ehdn; Arz Al-Shouf
Status: ?
Altitude range: up to 1200m (higher?)
Habitat: shrubby areas
Preferred time of observation: day
Observations of special interest: habitat type, altitude
Precautions for handling: none



Chelonidae

Caretta caretta

Common name: Loggerhead sea turtle
Adult size (approx.): 100 cm
Occurrence: Palm Island.
Status: abundant
Preferred time of observation: night; late May to Late June.
Observations of special interest: nesting time; beach characteristics; nest temperature.
Precautions for handling: none

General Information

The largest hard-shelled sea turtle.

Sexual maturity is reached at 10-15 years. Return to traditional breeding sites facilitated by imprinting (learning the properties of the coast) or following other experienced loggerheads.

Females breed every 2nd or 3rd yr.

Up to 7 egg-layings per female and nesting season for the same strip of beach.

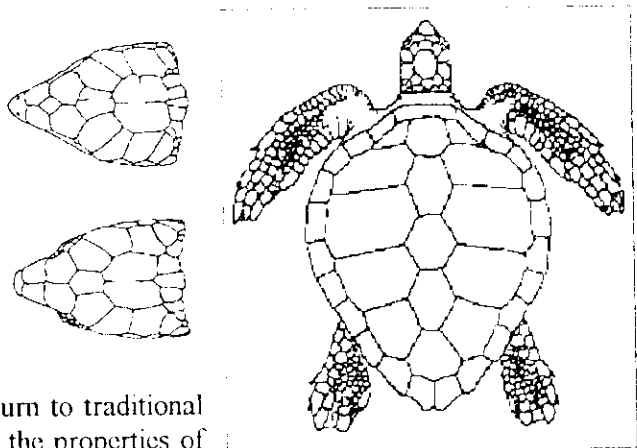
Nesting season: end of May until the end of June

Nesting sequence (lasting 1-2.5 hrs):

- Emerging from wave wash, crawling from surf to nest site.
- excavation of body-pit (about 80 cm in diameter, 50cm depth),
- excavation of egg-hole (20-30cm),
- laying eggs,
- filling and pounding of egg-hole,
- filling of body-pit,
- crawl from nest site to sea.

Egg size: 35-49 mm

Incubation time: 49-70 days



Chelonia mydas

Common name: Green Turtle

Adult size (approx.): 140 cm

Occurrence: Palm Island?

Status: rare on Lebanese shores?

Preferred time of observation: night, June-July

Observations of special interest: nesting time; beach characteristics; nest temperature.

Precautions for handling: none

General Information

Reproduction:

Sexual maturity reached at 25-30 years.

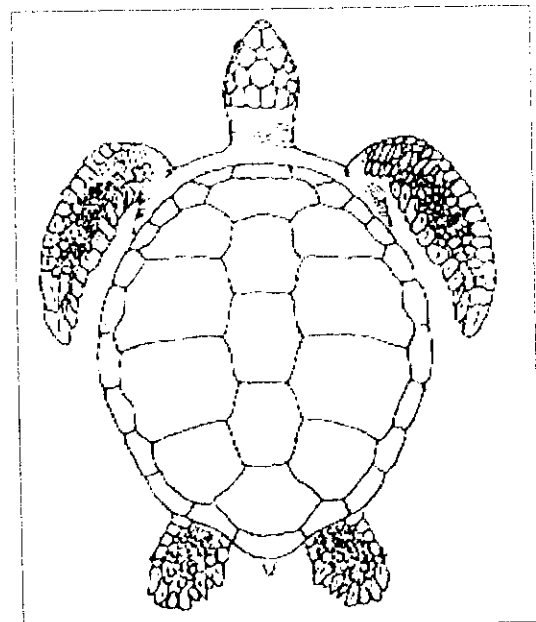
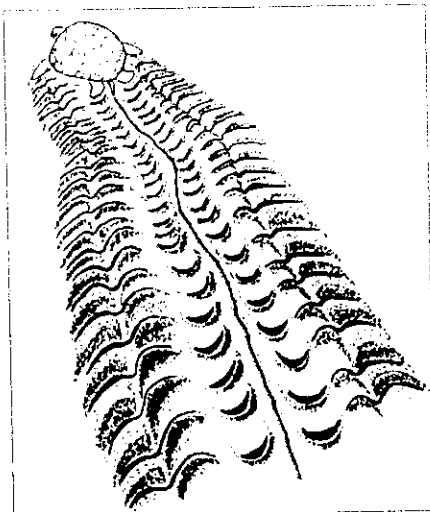
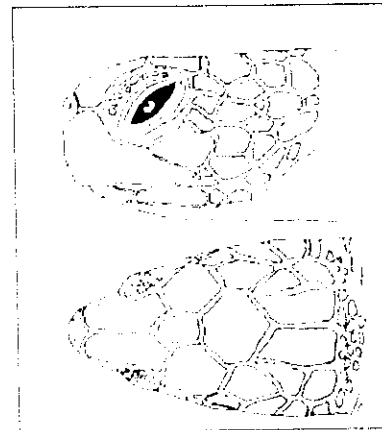
Females outnumber males.

Nesting season: in summer (June, July).

Number of eggs: 100 -150 eggs (max. 238).

Egg size: 35 - 58 mm in diameter.

Incubation time: 45-60 days.



REPTILES: LIZARDS

Chamaeleonidae

Chamaeleo chamaeleon

Common name: Chameleon; Herbaya

Adult size (approx.): 10-12 cm.

Occurrence: Horsh Ehdn, Arz Al-Shouf

Status: ?

Altitude range: ?

Habitat: woodland (on trees)

Preferred time of observation: day

Observations of special interest: Altitude, habitat type, plant species.

Precautions for handling: none

General Information: changes color according to mood and background.



Agamidae

Laudakia stellio stellio

Common name: Hardun

Adult size (approx.): 10-12 cm

Occurrence: Horsh Ehdn, Arz Al-Shouf

Status: Abundant

Altitude range: up to 2200 meters ?

Habitat: Rocky areas, woodlands.

Preferred time of observation: day

Observations of special interest:

Precautions for handling: none



Gekkonidae

Hemidactylus turcicus

Common name: Gecko, Abo Brayss.

Adult size (approx.): >4 cm

Occurrence: Horsh Ehdn, Arz Al-Shouf, Palm Island

Status: abundant but persecuted.

Altitude range: 0-?

Habitat: houses, walls.

Preferred time of observation: Night

Observations of special interest: Altitude

Precautions for handling: none; tail is very fragile and may be easily lost when handled.



Ptyodactylus puiseuxi

Common name: Gecko, Abo Brayss

Adult size (approx.): 5-6 cm

Occurrence: Eastern peripheries of Barouk mountains.

Status: abundant

Altitude range: ?

Habitat: Rocky areas; walls

Preferred time of observation: night; day during April-May

Observations of special interest: Altitude; habitat type.

Precautions for handling: none

General Information



Cyrtopodion amictopholis

Common name: Gecko, Abo Brayss

Adult size (approx.): <40cm?

Occurrence: Western slopes of Barouk ; Horsh Ehden ?

Status: ?

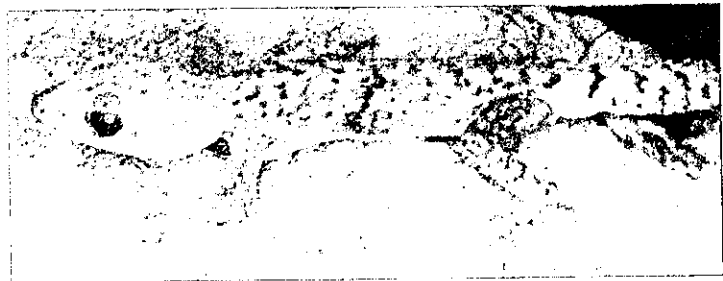
Altitude range: ?

Habitat: Rocky areas

Preferred time of observation: night

Observations of special interest: Altitude; habitat type

Precautions for handling: none but tail is very fragile and may easily be lost when handled.



Cyrtopodion kotschy

Common name: tree gecko, Abo Brayss Shajar.

Adult size (approx.): 4 cm

Occurrence: Horsh Ehden, Arz Al-Shouf

Status: Abundant

Altitude range: ?

Habitat: External House walls, trees, rocks.

Preferred time of observation: night

Observations of special interest: Altitude

Precautions for handling: none; tail is very fragile and may be easily lost when handled.



Lacertidae

Lacerta laevis laevis

Common name: Common wall lizard. Saqqaya, Shimmaysse

Adult size (approx.): 6-8 cm

Occurrence: Horsh Ehden, Arz Al-shouf, Palm islands (see lower picture)

Status: abundant

Altitude range: 0-1600 m (?), found at higher altitudes in the North than in the South.

Habitat: Moist habitats, walls, trees, rocks.

Preferred time of observation: day

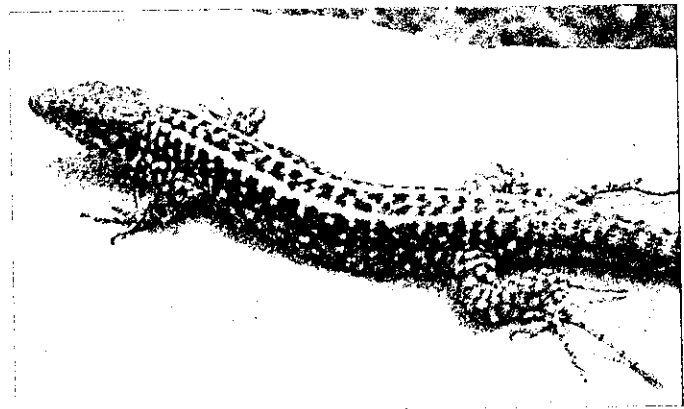
Observations of special interest: 1400-1600m altitude

Precautions for handling: none.

General Information: The color pattern of mainland populations is slightly variable. The Palm island populations are all very similar to the picture shown on the right. partly vegetarian.



Lacerta laevis laevis
(Palm Island Populations)



Lacerta kulzeri

Common name: Mount Lebanon Rock Lizard, Saqqaya Jabaliyyeh.

Adult size (approx.): 5-7 cm

Occurrence: Arz Al-Shouf, Horsh Ehden (?)

Status: endemic, abundant at high altitudes; rare at lower/upper altitude range

Altitude range: 1400-2100m

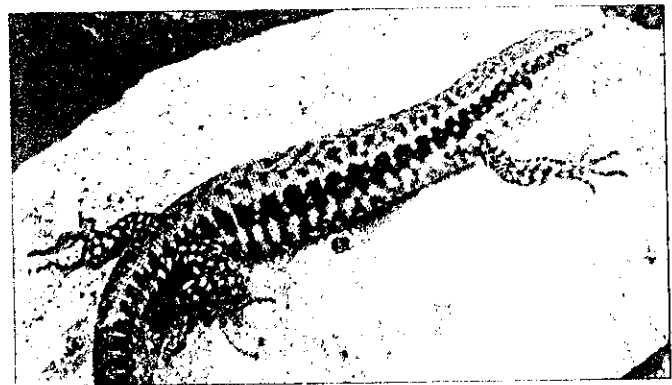
Habitat: Rocky slopes; trees (cedars)

Preferred time of observation: day

Observations of special interest: Altitude especially around 1400-1500 and upper altitude limits.

Precautions for handling: none

General Information: also found in Anti-Lebanon mountains.



Lacerta media

Common name: Green Lizard, Qarout

Adult size (approx.): 12 cm

Occurrence: Horsh Ehden, Arz Al-Shouf.

Status: abundant

Altitude range: 400-1600m (?)

Habitat: Moist

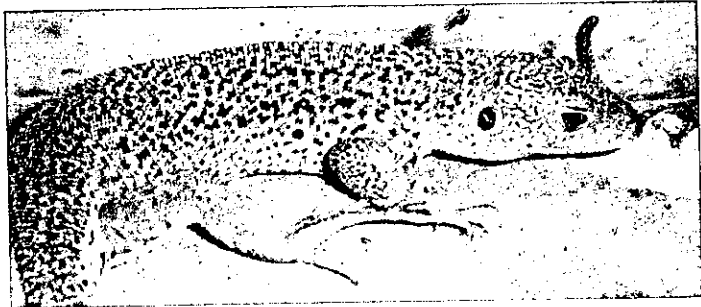
Preferred time of observation:

Morning

Observations of special interest: Altitude, habitat.

Precautions for handling: strong lizard, may give a painful bite.

General Information:



Ophisops elegans

Common name: Snake-eyed lizard, Shemmaysse

Adult size (approx.): 5 cm.

Occurrence: Horsh Ehden, Arz Al-Shouf

Status: abundant

Altitude range: 0-1500 m

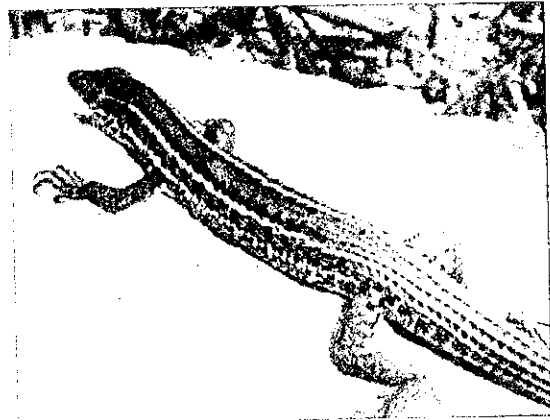
Habitat: dry scrub and open woodland.

Preferred time of observation: day

Observations of special interest: Altitude

Precautions for handling: none

General Information:



Scincidae

Mabuya vittata

Common name: Common Skink

Adult size (approx.): 7-9 cm

Occurrence: : Horsh Ehden, Arz Al-Shouf and Palm Island

Status: very abundant

Altitude range: 0 – 2800m (may be higher)

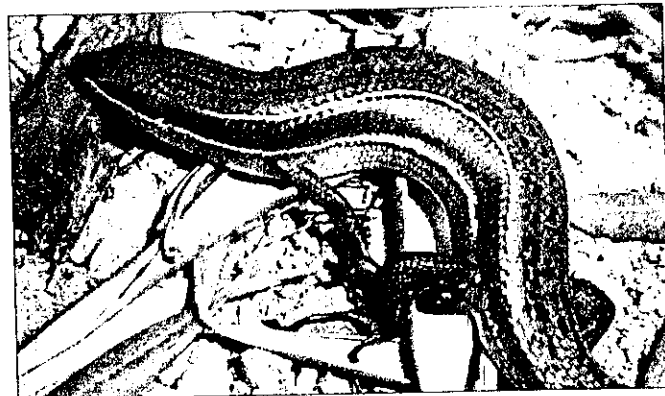
Habitat: open scrub ; open shrubland and woodland

Preferred time of observation: day

Observations of special interest: color variation.

Precautions for handling: none

General Information:



Ablepharus budaki budaki?

Common name: ?

Adult size (approx.): 3 cm.

Occurrence: Horsh Ehden, Arz Al-Shouf

Status: abundant ?

Altitude range: up to 1500m?

Habitat: Woodland, leaf litter.

Preferred time of observation: day/night

Observations of special interest: Altitude, forest and litter types.

Precautions for handling: none

General Information: a very small skink which is possible to find when disturbing leaf litter. It becomes active at night



Chalcides guentheri

Common name: Legless skink

Adult size (approx.): 10 cm

Occurrence: ?

Status: ?

Altitude range: ?

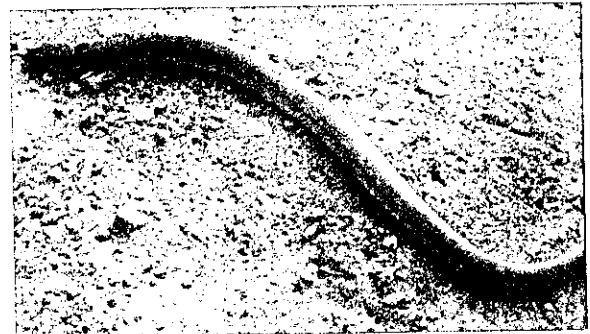
Habitat: ?

Preferred time of observation: day

Observations of special interest: Altitude and habitat type.

Precautions for handling: none.

General Information: May look like snake at first sight.



SNAKES

Colubridae

Coluber jugularis asianus

Common name: Large Whip Snake; Hanash Aswad

Adult size (approx.): Up to 300 cm

Occurrence: Horsh Ehden, Arz Al-Shouf and Palm island

Status: abundant but not on Palm Island.

Altitude range: 0 - ?

Habitat: varied.

Preferred time of observation: day

Observations of special interest:

Altitude; habitat type.

Precautions for handling: will fight back if cornered. It may bite fiercely but it is not venomous.

General Information:

This is the longest snake in Lebanon



Coluber jugularis asianus (juvenile)



Coluber najadum?

Common name: Small whip snake; Nashshabiyyeh

Adult size (approx.): >100 cm

Occurrence: Horsh Ehden, Arz Al-Shouf (?)

Status: ?

Altitude range: >1400m

Habitat: varied including cedar forests.

Preferred time of observation: day

Observations of special interest:

Altitude; habitat

Precautions for handling: bites in self-defence but not powerful nor venomous.

General Information: similar in general pattern to *Coluber rubriceps* (below) except that the band on the neck has a gap in the middle.



Coluber rubriceps

Common name: Small whip snake; Nashshabiyyeh
Adult size (approx.): >100cm
Occurrence: Horsh Ehden ; Arz Al-Shouf
Status: abundant
Altitude range: up
Habitat: varied.
Preferred time of observation: day



Observations of special int.:

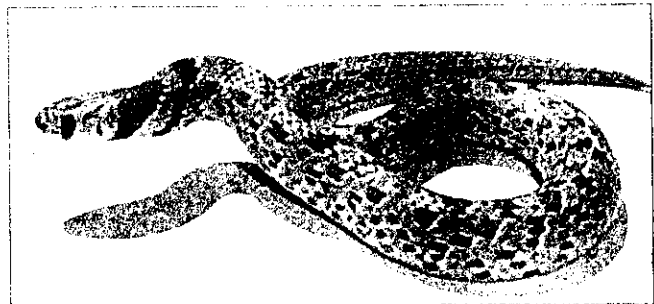
Altitude; Habitat type.

Precautions for handling: bites in self-defence but not powerful nor venomous.

General Information: similar in general pattern to *Coluber najadum* (above) except that the band on the neck has no gap in the middle. Found at lower altitudes.

Eirenis coronella

Common name: ?
Adult size (approx.): 15 cm.
Occurrence: Horsh Ehden ; Arz Al-Shouf
Status: ?
Altitude range: ?
Habitat: ?



Preferred time of observation: day

Observations of special interest:

Altitude; Habitat type.

Precautions for handling: none; a very pacifist snake.

General Information:

Eirenis levantina

Common name: Barsha
Adult size (approx.): <100 cm
Occurrence: Horsh Ehden ; Arz Al-Shouf
Status: abundant
Altitude range: ?
Habitat: varied



Preferred time of observation: day

Observations of special interest: Altitude; Habitat type

Precautions for handling: none.

General Information:

Elaphe quatuorlineata

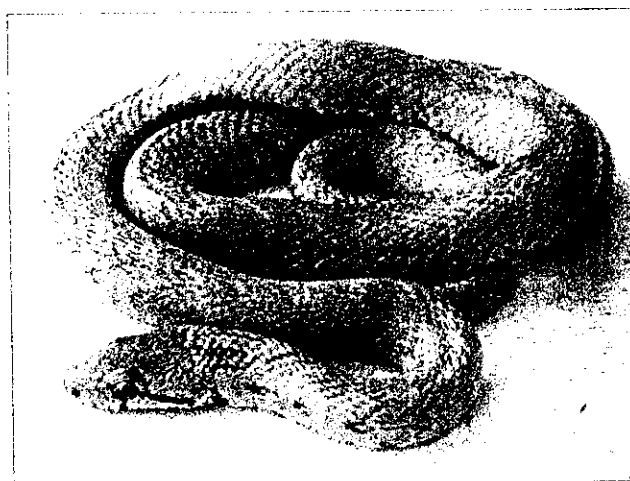
Common name: Hanash Al-Barouk
Adult size (approx.): >200cm
Occurrence: Barouk; Horsh Ehdén ??
Status: limited distribution
Altitude range: >1400m ?
Habitat: Forest
Preferred time of observation: day
Observations of special interest: Altitude;
Habitat type
Precautions for handling: none; not venomous
but may bite.



General Information: We have not observed this snake except in the Barouk region; not seen elsewhere. It can climb trees and raid birds' nests.

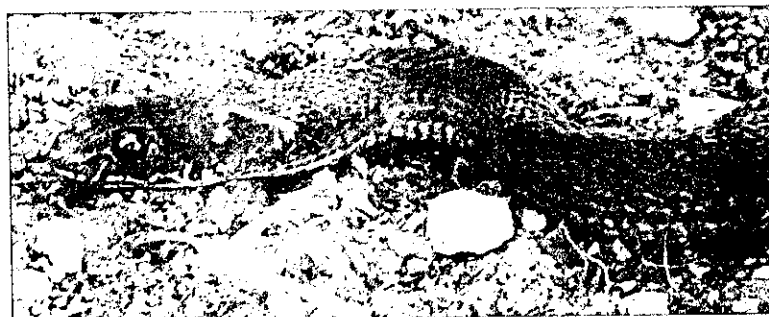
Elaphe hohenackeri

Common name: ?
Adult size (approx.): <100cm??
Occurrence: Horsh Ehdén ; Arz Al-Shouf
Status: abundant
Altitude range: ?
Habitat: varied.
Preferred time of observation: day
Observations of special interest:
Precautions for handling: none; may bite
in self-defense.
General Information:



Malpolon monspessulanus

Common name: Montpellier
Snake; Hanash Ahmar
Adult size (approx.): >180cm
Occurrence: Horsh Ehdén;
Arz Al-Shouf
Status: abundant
Altitude range: 0- 1600m ?
Habitat: Sunny shrubland and
open fields and field edges.



Preferred time of observation: day
Observations of special interest: maximum altitude.
Precautions for handling: this is venomous snake but it is back-fanged; may bite if
handled; venom may cause illness. Handle with care.
General Information: most common snake to be found killed by cars on the road

Natrix tessellata tessellata

Common name: Water snake; Hayyet May

Adult size (approx.): Up to 150 cm?

Occurrence: Horsh Ehden; Arz Al-Shouf

Status: abundant

Altitude range: up to 1500m ?

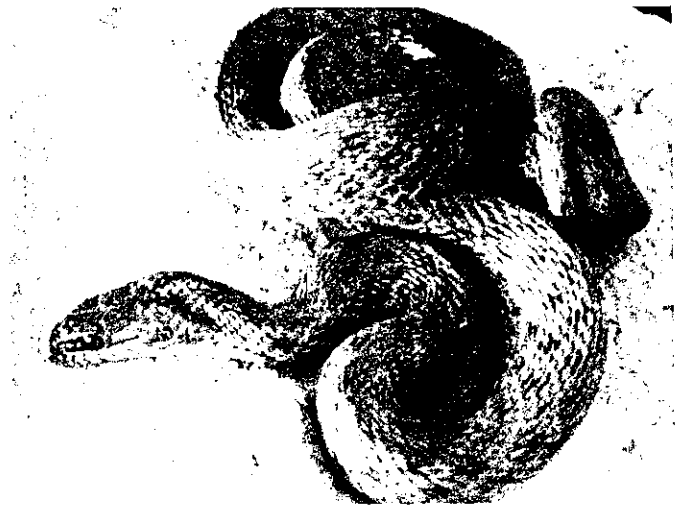
Habitat: ponds, marshes, rivers

Preferred time of observation: day

Observations of special interest: Altitude.

Precautions for handling: none; a very timid snake.

General Information:



Viperidae: The vipers are represented in Lebanon by 3 species found in various locations and altitudes. All these snakes are venomous and their bites may cause death. They become normally active at the end of the day and through the night. At high altitudes, they may become active during the day especially early and late in their activity season.

Vipera palaestinae?

Common name: Palestinian viper; Oqd A-Jouz

Adult size (approx.): 150+

Occurrence: Horsh Ehden, Arz Al-Shouf

Status: abundant

Altitude range: 0-1500m ?

Habitat: Rocky slopes, shrubland

Preferred time of observation: late afternoon, evening; night

Observations of special interest: Altitude; habitat

Precautions for handling: DANGEROUS; this is a front-fanged venomous snake and its bite may be fatal. NEVER handle by hand.

General Information:



Vipera bormmuelleri

Common name: Sannine viper; Afaa Sannine.

Adult size (approx.): >60 cm

Occurrence: Horsh Ehden? Arz Al-Shouf?

Status: abundant at high altitudes.

Altitude range: >1500 ?

Habitat: Rocky and montane vegetation (Jord)

Preferred time of observation:

day/night depending on season.

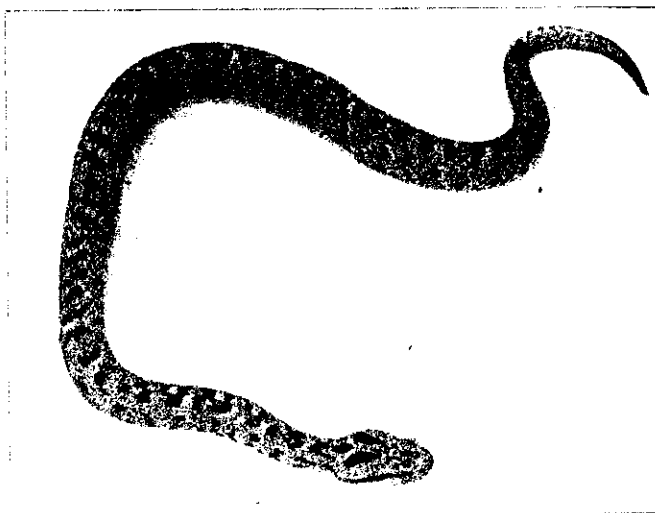
Observations of special interest:

Altitude.

Precautions for handling:

DANGEROUS; this is a front-fanged venomous snake and its bite may be fatal. NEVER handle by hand.

General Information: This is a small viper that has been found in Sannine and Bsharre Cedar Forest. It has not been actually observed in the protected areas but it's likely to be found in Horsh Ehden and Arz Al-Shouf at high altitudes.



Vipera lebetina

Common name: Levant viper, Afaa or Sill

Adult size (approx.): up to 200cm

Occurrence: Horsh Ehden? Arz Al-Shouf?

Status: ?

Altitude range: >1000m ?

Habitat: rocky areas and slopes and along the banks of streams.

Preferred time of observation:

day/night depending on season.

Observations of special interest:

Altitude range; habitat type

Precautions for handling:

DANGEROUS; this is a front-fanged venomous snake and its bite may be fatal; extremely powerful venom. NEVER handle by hand.

General Information: This is the largest viper in Lebanon but *V. palaestinae* may also be quite large. This has been observed above the Hermel region at around 1000m. It is thought to occur in various locations including the high-altitude protected regions.



ENG. MOUNIR ABI SAID

MONITORING TERRESTRIAL MAMMALS

Jackal

Canis aureus syriacus

It is between the wolf and the fox. It differs from the fox by its short tail and from the wolf by its size. It lives in forests and bushy areas and in close proximity to villages. It roams from sunset till dawn and can travel between 5-20 km a day. The female is smaller than the male. It delivers at the end of spring between 4-6 cubs who leave their den at the age of six months. Its den is a straight hole little sloppy that ends with a big room. There are 2-4 trails for escaping or aeration.



The following items give us an idea of what and how to monitor:

- Time: Sunset to dawn and count them
- Den search: look for their dens
- Season: At the end of the spring, look in underground dens for cubs and count them
- Schedule: Field visits, once or twice a month, and should be increased to go on weekly basis at the end of spring
- Safety first:
- The jackals are shy animals, and it was never reported to be attacking humans, but precautions should be taken when looking for the dens, since the attack could happen as self-defense.
 - When the baby jackals are found, do not touch them. Only count their number and record it, as well the area of the den should be recorded

2. Try not to disturb a herd

How and what to Monitor

- **Observation Site:** Since they got good hearing and smell senses, remain calm and sit opposite to the wind since the wind might allow the boar to detect us.
- **Indicator of their presence:**
 1. We can tell their existence, since they *turn* the soil they pass across.
 2. We can hear their “snuffing” sounds while feeding
 3. We can find them beside wet areas or water collectors
- **Count:**
 1. Count their number and their young in April, because if they are increasing in number, some control measures should be taken, as they might destroy the vegetation in protected areas in no time, since no natural enemy is present.
 2. You can tell the number from the footprints, and this is best estimated close to water bodies.

Jungle cat

Felis chaus



This cat is an endangered animal. It was seen in the *Aamiq swamps*, as well as in the Shouf Cedar Nature Reserve. Its habitats include wet areas, near water catches, and bushy areas and forests. The jungle cat is a very strong, brave, active and agile animal. It goes out at night to feed on frogs, snakes, rodents, etc. It can climb trees to feed on birds and chicks in nests. It looks like a big cat with a dull brown or tawny olive color, i.e., it is very well camouflaged. Females deliver at the end of April and the young stay

with the mother for about 4-5 months.

Safety:

- This cat is strong and wild. Be careful when you face it or if it is cornered, because of it may attack.

What and how to Monitor

- Look for their tracks
- Look for their stool – it usually contains residues of the cats fur
- Record the number of sightings, including their date and location
- Count their number

Porcupine

Hyotrix indica indica

It is a nocturnal rodent. It goes out at night and lives in self-dug burrows or natural caves. It is distinguished by its black and white quills that might be seen shed on the ground, and therefore indicating their presence. It lives near cultivated or bushy areas. It enjoys searching and eating bulbs. The animal runs with its entire sole brushing the ground. But sometimes, when traveling over difficult terrain, it does not always move with its entire sole touching the ground. On



such occasions, the porcupine will leave prints showing only the toes and front pads. This make cause some confusion with other animals like the badger, but finding quills is a good indicator of the porcupine's passage.

Safety:

- Do not get too close to them. They don't throw their quills, but if they accidentally touch us, then quills might poke our skin and penetrate.

How and where to monitor

- Look for quills
- Search in caves

Hyaena

Hyaena hyaena syriaca

It is the biggest carnivore in Lebanon. It has forelegs longer than hindlegs, which affects its foot prints, where the front leg will look clearer than the rear ones. The hyaena is very big in size. It has long pointed ears and a striated black coat covers most of its body. They live alone or in pairs. They are very important in the wild since they scavenge on carcasses. This species is highly omnivorous eating carrion, vegetable, large mammals and reptiles.

Safety:

- Hyenas are easily scared animals. Nevertheless, we can get fairly close to them. It is a rule of thumb to *never run in front animals*. Hyaenas attack if *threatened* only.

What and how to Monitor

- Beware of caves as they represent a favorite hideout and resting place for hyaenas during the day.
- Footprints are confusing since they might be mistaken for a dog or wolf. Hyaenas' scats are similar to large cats, but fragments of bones are very common.



Badger

Meles meles canescens

The badger is a nocturnal animal. It is characterized by 2 black stripes that run over the eyes as far as the ears. The rest of the head is white. They live in woodlands and sometimes at high altitude. The badger lives a quite independent life. It spends all the winter in its burrow, which consists of 4-8 passages, wide chambers and an entrance. They use the passages either to escape or for aeration. The badger delivers in February-to-March and the young stay with their mother 4 months. Badgers are solitary animals.



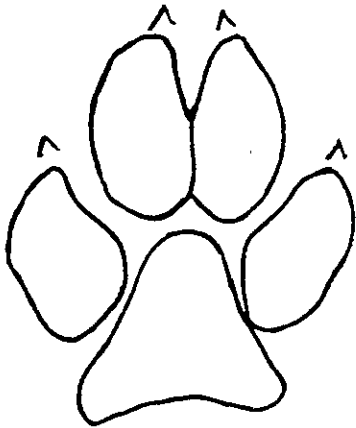
Safety: None

What and how to monitor

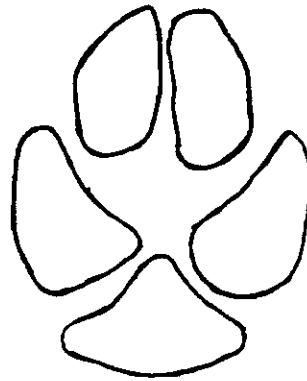
1. Look for footprints. Sometimes it can be mistaken with the prints of a cat, especially that the fifth toe is not clear.

FOOT PRINTS

Drawn to scale



Jackal



Fox



Jungle Cat



Porcupine



Hyaena (front)



Hyaena (rear)



Dog



Badger

الجمهورية اللبنانية
مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام