

OPWALL 2006

BOTANY REPORT

REBECCA GUENTHER

BOTANIST

Low Elevation Wadi's

White Canyon

Date: 7/7/06

Location: 34°25.516E, 28°53.451N, 690 meters

Coverages:

Large Rock: 1%	Overstory: 0%	Overstory height: 0 m/0m
Small Rock: 2%	Shrub: 4%	Shrub height: 10 cm/3 m
Bare/Fine: 96%	Herbaceous: 0%	Herbaceous height: 0m
Litter: 1%	Total: 4%	

Description: Wadi habitat consisting of a sand substrate and sedimentary geological features. Wadi is approximately 15 meters in width and orientated at 354°, with a northwest slope aspect. Wadi steepness is low, with only 1-5% incline. The topography of the wadi is concave. Vegetation is sparse, with only a mature shrub component and few species present. Site is dominated by *Retama raetam* and *Haloxylon salicornicum*. Sample site is located near White Canyon behind a Bedouin garden to the west. Impacts on site include medium grazing and low human disturbance.

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	3
Medium	<i>Haloxylon salicornicum</i>	1
Low	<i>Crotalaria aegyptiaca</i>	<1
Low	<i>Ochradenus baccatus</i>	<1

Dung:

Animal	Age Category	Average Number
camel	5	3
donkey	4	1
goat	4	15
goat	5	31
rabbit	5	3

Tebik el Marrah

Date: 13/7/06

Location: 34°10.890E, 28°45.944N, 980 meters

Coverages:

Large Rock: 85%	Overstory: 1%	Overstory height: 5 m/8 m
Small Rock: 15%	Shrub: 4%	Shrub height: 8 cm/0.5 m
Bare/Fine: <1%	Herbaceous: <1%	Herbaceous height: 0.9 m
Litter: <1%	Total: 5%	

Description: Wadi habitat consisting of gravel substrate with Basalt and Granite Igneous geology. Wadi has concave topography. The slope is approximately 5-25% and has a

northwest aspect. Wadi is approximately 10 meters wide and is orientated to the southwest (200°). Site consists of steep rock walls, with large boulders in wadi bed. Camels heavily graze vegetation, mostly. Due to intense grazing activity, plants seem to have poor health overall. Vegetation is dominated by *Acacia tortilis*, *Retama raetam*, *Iphionea scabra*, and *Fagonia mollis*. The vegetation consists of trees with 6-11” diameter at breast height (dbh), which is in the range of 10-20 feet tall, the shrub component consists of mature individuals.

Plant List:

Strata	Plant	Cover
Tall	<i>Acacia tortilis</i>	1
Medium	<i>Aerva javanica</i>	<1
Medium	<i>Haloxylon salicornicum</i>	<1
Medium	<i>Launea spinosa</i>	<1
Medium	<i>Lycium shawii</i>	<1
Medium	<i>Ochradenus baccatus</i>	<1
Medium	<i>Oostegia fruiticosa</i>	<1
Medium	<i>Retama raetam</i>	<1
Low	<i>Artemisia judaica</i>	<1
Low	<i>Cucumbis prophetarum</i>	<1
Low	<i>Fagonia arabica</i>	<1
Low	<i>Fagonia mollis</i>	1
Low	<i>Iphionea scabra</i>	1
Low	<i>Kickxia aegyptiaca</i>	<1
Low	<i>Lavendula coronipifolia</i>	<1
Low	<i>Pulicaria undulata</i>	<1
Low	<i>Reseda pruinosa</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Stipagrostis ciliata</i>	<1
Low	<i>Teucrium leucocladum</i>	<1
Low	<i>Zilla spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
camel	4	20
camel	5	68.33333333
goat	4	45
goat	5	17.5
ibex	2	36

Sa'al

Date: 13/7/06

Location: 34°12.287 E, 28°45.584 N, 966 meters
34°12.364 E, 28°45.504 N, 966 meters

Coverages:

Large Rock: 33%

Small Rock: 65%

Bare/Fine: 1%

Overstory: 4%

Shrub: 5%

Herbaceous: 0%

Overstory height: 7 m/9 m

Shrub height: 8 cm/0.7 m

Herbaceous height: 0 m

Litter: <1%

Total: 9%

Large Rock: 30%

Overstory: 2%

Overstory height: 18 m/20 m

Small Rock: 69%

Shrub: 4%

Shrub height: 8 cm/0.5 m

Bare/Fine: <1%

Herbaceous: 0%

Herbaceous height: 0 m

Litter: <1%

Total: 6%

Description: Wadi consists of a medium sand substrate with some large rocks and sedimentary and igneous geology. Topography of the site is concave to flat, with a slope steepness of 1-5%. Wadi width varies from 25 meters to 70 meters and the orientation ranges from southeast to southwest (174°, 228°). The wadi bed is heavily channelized with undulating direction of the channel. Disturbance in the wadi include low amounts of grazing and also low amounts of human impacts by vehicles. Vegetation is dominated by *Acacia ehebergii*, *Acacia tortilis*, and *Fagonia mollis*. The tree component consists of individuals ranging from 6-11 dbh and 10-20 feet in height. The shrub component consists of mature and young individuals.

Plant List:

Strata	Plant	Cover
Tall	<i>Acacia ehebergii</i>	2
Tall	<i>Acacia tortilis</i>	<1
Medium	<i>Aerva javanica</i>	<1
Medium	<i>Crotalaria aegyptiaca</i>	<1
Medium	<i>Fagonia mollis</i>	2
Medium	<i>Iphionea scabra</i>	<1
Medium	<i>Lycium shawii</i>	<1
Medium	<i>Pergularia tomentosa</i>	<1
Low	<i>Astragalus spinosa</i>	<1
Low	<i>Blepharis edulis</i>	<1
Low	<i>Citrullus colocynthis</i>	<1
Low	<i>Cucumbis prophetarum</i>	<1
Low	<i>Ephedra aphylla</i>	<1
Low	<i>Fagonia brugeri</i>	<1
Low	<i>Peganum harmala</i>	<1
Low	<i>Reseda pruinosa</i>	<1
Low	<i>Teucrium leucocladum</i>	<1
Low	<i>Teucrium polium</i>	<1
Low	<i>Trichlodesma africans</i>	<1
Low	<i>Zilla spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
camel	3	10
camel	4	19
camel	5	7
goat	3	20
goat	4	12.5
goat	5	19

Rum

Date: 6/7/06

Location: 34°25.004 E, 28°54.321 N, 718 meters

Coverages:

Large Rock: 2%	Overstory: 0%	Overstory height: 0 m/0 m
Small Rock: 0%	Shrub: 6%	Shrub height: 8 cm/1.3 m
Bare/Fine: 96%	Herbaceous: <1%	Herbaceous height: 5 cm
Litter: 2%	Total: 7%	

Description: Wadi bed consists of a fine sand substrate with sedimentary geology. The wadi has concave topography, a northwestern slope aspect and a slope of 1-5%. The wadi is approximately 15 meters wide and is orientated to the northwest (350°). Sample location is at the beginning of the wadi, leading into Ain Hodra. Vegetation consists of mounding habit dominated by *Retama raetam* and *Anabasis articulata*. The shrub component consists of mature individuals and the herbaceous component consists of individuals fewer than 12 inches in height. Disturbance consists of low amounts of grazing and low human impacts.

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	4
Medium	<i>Anabasis articulata</i>	2
Low	<i>Fagonia glutinosa</i>	<1
Low	<i>Heliotropium digynum</i>	<1
Medium	<i>Capparis spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
camel	4	39
camel	5	9.5
rabbit	5	1

Marrah

Date: 12/7/06, 14/7/06

Location: 34°11.502 E, 28°46.704 N, 949 meters

34°10.258 E, 28°46.357 N, 978 meters

34°11.800 E, 28°47.409 N, 937 meters

Coverages:

Large Rock: 2%	Overstory: 4%	Overstory height: 6 m/8 m
Small Rock: 81%	Shrub: 28%	Shrub height: 8 cm/1.3 m
Bare/Fine: 4%	Herbaceous: 0%	Herbaceous height: 0 m
Litter: <1%	Total: 32%	

Large Rock: 25%	Overstory: 5%	Overstory height: 6 m/8 m
Small Rock: 30%	Shrub: 17%	Shrub height: 8 cm/1.6 m

Bare/Fine: 40%
Litter: <1%

Herbaceous: 0%
Total: 22%

Herbaceous height: 0 m

Large Rock: 7%
Small Rock: 50%
Bare/Fine: 43%
Litter: <1%

Overstory: 1%
Shrub: 17%
Herbaceous: 0%
Total: 18%

Overstory height: 10 m/17 m
Shrub height: 10 cm/1.3 m
Herbaceous height: 0 m

Description: Wadi bed consists of fine to medium sand substrate with sedimentary and igneous geology. Topography ranges from flat to slightly concave. Slope aspects range from flat to a southeastern exposure. The steepness of the slope ranges from flat (0°) to 1-5%. The width of the wadi ranges from 75 meters to 450 meters and is orientated to the northeast and to the southeast (40°, 254°). Vegetation dominated by *Acacia tortilis*, *Artemisia judaica*, and *Zilla spinosa*. Most individuals are in a dormant stage and there is a low amount of diversity of species. Disturbance impacts include moderate to low amounts of grazing and human impacts due to high amounts of vehicle use within the wadi bed.

Plant List:

Strata	Plant	Cover
Tall	<i>Acacia tortilis</i>	1
Medium	<i>Aerva javanica</i>	<1
Medium	<i>Artemisia judaica</i>	10
Medium	<i>Deverra tortuosa</i>	<1
Medium	<i>Iphionea scabra</i>	<1
Medium	<i>Lycium schufurtii</i>	<1
Medium	<i>Lycium shawii</i>	<1
Medium	<i>Ochradenus baccatus</i>	<1
Medium	<i>Retama raetam</i>	<1
Medium	<i>Zilla spinosa</i>	8
Low	<i>Achillea fragrantissima</i>	<1
Low	<i>Asphdelphus sp.</i>	<1
Low	<i>Crotalaria aegyptiaca</i>	<1
Low	<i>Fagonia brugeri</i>	<1
Low	<i>Fagonia mollis</i>	3
Low	<i>Launea spinosa</i>	<1
Low	<i>Lavendula coronipifolia</i>	<1
Low	<i>Pulicaria undulata</i>	<1
Low	<i>Pycnocycla tomentosa</i>	<1
Low	<i>Teucrium leucocladum</i>	<1
Low	<i>Zygophyllum coccineum</i>	<1

Dung:

Animal	Age Category	Average Number
camel	2	11
camel	3	12
camel	4	2.5
camel	5	28.2

donkey	2	5.5
donkey	5	4
goat	2	32.5
goat	4	3
goat	5	26.25

Ain Hodra

Date: 5/7/06

Location: 34°25.592 E, 28°54.443 N, 645 meters

Coverages:

Large Rock: 2%

Small Rock: 3%

Bare/Fine: 95%

Litter: <1%

Overstory: 0%

Shrub: 8%

Herbaceous: 0%

Total: 8%

Overstory height: 0 m/0 m

Shrub height: 10 cm/1.5 m

Herbaceous height: 0 m

Description: Wadi bed consists of a sand substrate with sedimentary geology. The topography of the wadi is concave. The slope exposure of the wadi is variable and has a steepness of 1-5%. The wadi is approximately 150 meters wide and is orientated to the northeast (62°). Vegetation in the wadi bed is sparse with few species present. Mature *Retama raetam* and *Haloxylon salicornicum* individuals dominate vegetation. There is a low amount of disturbance by humans and vehicles.

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	5
Medium	<i>Capparis sinaica</i>	<1
Medium	<i>Haloxylon salicornicum</i>	2
Low	<i>Cleome droserifolia</i>	<1
Low	<i>Fagonia mollis</i>	<1
Low	<i>Heliotropium digynum</i>	<1
Low	<i>Ipshionea scabra</i>	<1

Dung:

Animal	Age Category	Average Number
camel	3	8
camel	4	3
camel	5	7.666666667
goat	3	9
goat	5	34

Mid Elevation Wadi's

Abu Dagash

Date: 2/8/06

Location: 33°55.078 E, 28°35.145 N, 1445 meters

Coverages:

Large Rock: 40%

Overstory: 0%

Overstory height: 0 m/0 m

Small Rock: 54%
 Bare/Fine: 9%
 Litter: <1%

Shrub: 7%
 Herbaceous: 0%
 Total: 7%

Shrub height: 1 cm/1.0 m
 Herbaceous height: 0 m

Description: Wadi bed consists of a fine gravel substrate with granite geology. Wadi is a tributary wadi located above Itlah. Wadi has a concave topography with a northeastern slope exposure (12°). The steepness of the wadi bed is 1-5%. The wadi is approximately 5 meters wide and is orientated to the north (12°). The wadi bed has a sloped habitat but the water channel is distinct. The vegetation is dominated by young *Chiliadenus montanus* and *Matthiola arabica*, which are in good health possibly due to a low amount of disturbance by grazing.

Plant List:

Strata	Plant	Cover
Tall	<i>Chiliadenus montanus</i>	1
Tall	<i>Matthiola arabica</i>	2
Medium	<i>Artemisia herba-alba</i>	1
Medium	<i>Capparis spinosa</i>	<1
Medium	<i>Deverra triradiata</i>	<1
Medium	<i>Farsetia aegyptiaca</i>	<1
Medium	<i>Zilla spinosa</i>	<1
Low	<i>Alkanna orientalis</i>	<1
Low	<i>Astragalus spinosa</i>	<1
Low	<i>Bufonia multiceps</i>	<1
Low	<i>Diploaxis harra</i>	<1
Low	<i>Fagonia brugueri</i>	<1
Low	<i>Fagonia mollis</i>	3
Low	<i>Galium sinaica</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Tancetum sinaica</i>	<1
Low	<i>Teucrium leucocladum</i>	<1

Dung:

Animal	Age Category	Average Number
fox	2	2

Baidaa

Date: 29/6/06

Location: 34°07.932 E, 28°29.564 N, 1256 meters
 34°07.703 E, 28°29.786 N, 1243 meters

Coverages:

Large Rock: 72%
 Small Rock: 28%
 Bare/Fine: <1%
 Litter: <1%

Overstory: 0%
 Shrub: 7%
 Herbaceous: 0%
 Total: 8%

Overstory height: 0 m/0 m
 Shrub height: 8 cm/2.1 m
 Herbaceous height: 0 m

Large Rock: 76%

Overstory: 0%

Overstory height: 0 m/0 m

Small Rock: 23%
 Bare/Fine: <1%
 Litter: 1%

Shrub: 7%
 Herbaceous: 0%
 Total: 8%

Shrub height: 8 cm/2.1 m
 Herbaceous height: 0 m

Description: Wadi consists of medium gravel to large cobble substrate with granite geology and the presence of basalt dykes. Wadi has a concave topography and a northwestern (345°) slope exposure. The wadi is approximately 15 meters wide and is orientated southeast and southwest (160° to 257°), with a steepness of 1-5%. The wadi channel is narrow with heavily sloped walls and large boulders in the wadi bed. Vegetation is dominated by *Retama raetam* and *Launea spinosa*. Individuals of the shrub component are mature and the herbaceous component is less than 12 inches in height. There is a high cover of vegetation but a low amount of diversity of species. There is a high amount of grazing and a low amount of human disturbance occurring.

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	1
Tall	<i>Tamarix nilotina</i>	<1
Medium	<i>Achillea fragrantissima</i>	<1
Medium	<i>Aerva javanica</i>	1
Medium	<i>Anabasis articulata</i>	<1
Medium	<i>Ballota sp.</i>	<1
Medium	<i>Capparis spinosa</i>	<1
Medium	<i>Chiliadenus montanus</i>	<1
Medium	<i>Iphionea scabra</i>	<1
Medium	<i>Launea spinosa</i>	1
Medium	<i>Lavendula coronipifolia</i>	<1
Medium	<i>Lycium shawii</i>	<1
Medium	<i>Ochradenus baccatus</i>	<1
Medium	<i>Pycnocycla tomentosa</i>	<1
Medium	<i>Zygophyllum coccineum</i>	1
Low	<i>Blepharis edulis</i>	<1
Low	<i>Citrullus colocynthis</i>	<1
Low	<i>Cleome droserifolia</i>	<1
Low	<i>Fagonia mollis</i>	<1
Low	<i>Gymnocarpus decandrus</i>	<1
Low	<i>Heliotropium digynum</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Teucrium polium</i>	<1

Dung:

Animal	Age Category	Average Number
camel	5	11.5
donkey	4	28
donkey	5	57
goat	5	16.66666667

El Hadibi

Date: 3/8/06

Location: 33°55.426 E, 28°34.926 N, 1459 meters

Coverages:

Large Rock: 24%

Small Rock: 30%

Bare/Fine: 40%

Litter: <1%

Overstory: 0%

Shrub: 6%

Herbaceous: 0%

Total: 6%

Overstory height: 0 m/0 m

Shrub height: 2 cm/1.9 m

Herbaceous height: 0 m

Description: Wadi substrate consists of fine gravel with granite and quartz geology. Wadi has a concave topography with a northwestern (350°) slope exposure. The slope of the wadi bed is >25%. Wadi is approximately 20 meters wide and is orientated to the north (20°). Wadi is narrow with many large boulders. Somewhat of a farsh system above Itlah, wadi bed is not well defined. There is also an abundance of lichens and mosses at this site. Vegetation is dominated by young *Fagonia mollis* and *Artemisia herba-alba*. There is a moderate amount of disturbance by goat grazing.

Plant List:

Strata	Plant	Cover
Tall	<i>Ochradenus baccatus</i>	<1
Medium	<i>Artemisia herba-alba</i>	2
Medium	<i>Capparis spinosa</i>	<1
Medium	<i>Farsetia aegyptiaca</i>	<1
Medium	<i>Matthiola arabica</i>	<1
Medium	<i>Origanum syricum-sinaicum</i>	<1
Low	<i>Alkanna orientalis</i>	<1
Low	<i>Astragalus spinosa</i>	<1
Low	<i>Atriphaxis spinosa</i>	<1
Low	<i>Deverra tortuosa</i>	<1
Low	<i>Fagonia mollis</i>	3
Low	<i>Galium sinaica</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Zilla spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
goat	5	3
camel	5	70

Farsh Nasb

Date: 29/6/06

Location: 34°07.549 E, 28°28.866, 1348 meters

Coverages:

Large Rock: 52%

Small Rock: 48%

Bare/Fine: <1%

Overstory: 0%

Shrub: 12%

Herbaceous: 0%

Overstory height: 0 m/0 m

Shrub height: 4 cm/1.0 m

Herbaceous height: 0 m

Litter: <1%

Total: 12%

Description: Wadi bed consists of gravel substrate with granite geology with basalt dykes. Wadi has a concave topography, and has 1-5% slope. The width is approximately 15 meters and is orientated to the northeast (40°). The wadi is characterized as being a plateau farsh system with a shallow water channel. The vegetation is dominated by mature *Retama raetam* and *Zilla spinosa*. There is moderate disturbance from grazing animals.

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	1
Medium	<i>Aerva javanica</i>	<1
Medium	<i>Artemisia judaica</i>	<1
Medium	<i>Chiliadenus montanus</i>	<1
Medium	<i>Launea spinosa</i>	1
Medium	<i>Ochradenus baccatus</i>	<1
Low	<i>Caylusea hexagyna</i>	<1
Low	<i>Cleome droserifolia</i>	<1
Low	<i>Fagonia mollis</i>	3
Low	<i>Gymnocarpus decandrus</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Zilla spinosa</i>	7

Dung:

Animal	Age Category	Average Number
donkey	5	2
goat	5	5

Gharba

Date: 20/7/06

Location: 33°54.250 E, 28°39.185 N, 1144 meters

Coverages:

Large Rock: 15%

Small Rock: 8%

Bare/Fine: 69%

Litter: <1%

Overstory: 1%

Shrub: 6%

Herbaceous: <1%

Total: 7%

Overstory height: 5 m/7.5 m

Shrub height: 4 cm/2.0 m

Herbaceous height: 2 cm

Description: Wadi substrate consists of medium sand component with granite geology. Wadi has a concave topography with 1-5% slope. Wadi is orientated to the east (100°) and is approximately 25 meters wide. There are evident signs of recent water action, including presence of debris. Wadi bed consists of large boulders and cobbles, with a channel that is bare and vegetation is restricted to wadi slopes. Vegetation is dominated by mature *Tamarix nilotina*, *Retama raetam* and *Artemisia judaica*. The tree component ranges from 6-11 inches dbh and 10-20 feet in height. There is evidence of moderate impacts due to grazing.

Plant List:

Strata	Plant	Cover
Tall	<i>Tamarix nilotina</i>	<1
Medium	<i>Anabasis articulata</i>	<1
Medium	<i>Artemisia judaica</i>	3
Medium	<i>Gymnocarpus decandrus</i>	<1
Medium	<i>Haloxylon scoparia</i>	2
Low	<i>Achillea fragrantissima</i>	<1
Low	<i>Alkanna orientalis</i>	<1
Low	<i>Citrullus colocynthis</i>	<1
Low	<i>Fagonia brugeri</i>	1
Low	<i>Fagonia mollis</i>	<1
Low	<i>Juncus sp.</i>	<1
Low	<i>Peganum harmala</i>	<1
Low	<i>Zilla spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
camel	5	8
goat	3	29
goat	4	28
goat	5	795
sheep	5	16

Hibran**Date:** 13/7/06**Location:** 33°52.982 E, 28°38.100 N, 1104 meters**Coverages:**

Large Rock: 41%

Small Rock: 52%

Bare/Fine: 1%

Litter: <1%

Overstory: 0%

Shrub: 6%

Herbaceous: <1%

Total: 6%

Overstory height: 0 m/0 m

Shrub height: 4 cm/1.5 m

Herbaceous height: 6 cm

Description: Wadi bed consists of coarse sand to fine gravel substrate with sedimentary and igneous geology, with basalt and granite dyke features. The topography of the wadi is flat with 0% steepness. The width of the wadi is approximately 125 meters and is orientated to the northeast (120°). Wadi bed consists of large boulders and cobble sized rocks. The vegetation is dominated by young *Retama raetam*, *Hyoscamnus boveanus*, and *Achillea fragrantissima*. The herbaceous component is less than 12 inches in height. There is heavy use of this wadi by Bedouin for the World Food Project, including the existence of many wells. There is also moderate disturbance from grazing.

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	<1

Medium	<i>Achillea fragrantissima</i>	3
Medium	<i>Artemisia judaica</i>	<1
Medium	<i>Asclepias sinaica</i>	<1
Medium	<i>Deverra tortuosa</i>	<1
Medium	<i>Farsetia aegyptiaca</i>	<1
Medium	<i>Hyoscamnus boveanus</i>	2
Medium	<i>Lavendula coronipifolia</i>	<1
Medium	<i>Ochradenus baccatus</i>	<1
Medium	<i>Origanum syricum-sinaicum</i>	<1
Medium	<i>Pulicaria undulata</i>	<1
Medium	<i>Tancetum sinaica</i>	<1
Medium	<i>Verbascum sinaiticum</i>	<1
Low	<i>Alkanna orientalis</i>	<1
Low	<i>Androchne aspera</i>	<1
Low	<i>Ballota undulata</i>	<1
Low	<i>Chiliadenus montanus</i>	<1
Low	<i>Citrullus colocynthis</i>	<1
Low	<i>Cucumbis prophetarum</i>	<1
Low	<i>Cynodon dactylon</i>	<1
Low	<i>Echinops glabberimus</i>	<1
Low	<i>Erodium sp.</i>	<1
Low	<i>Fagonia brugeri</i>	<1
Low	<i>Fagonia mollis</i>	<1
Low	<i>Launea nudicaulis</i>	<1
Low	<i>Plantago sinaica</i>	<1
Low	<i>Schimus barbatus</i>	<1
Low	<i>Stipagrostis ciliata</i>	<1
Low	<i>Zilla spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
camel	5	1
donkey	2	7
donkey	3	24
donkey	4	33
donkey	5	3
goat	5	185

Itlah

Date: 2/8/06, 3/8/06, 4/8/06

Location: 33°55.131 E, 28°35.451 N, 1370 meters
33°55.408 E, 28°34.786 N, 1430 meters
33°55.359 E, 28°34.849 N, 1414 meters
33°55.113 E, 28°35.243 N, 1389 meters

Coverages:

Large Rock: 24%

Overstory: 4%

Overstory height: 9 m/11 m

Small Rock: 57%	Shrub: 5%	Shrub height: 6 cm/0.7 m
Bare/Fine: 10%	Herbaceous: <1%	Herbaceous height: 2 cm
Litter: <1%	Total: 9%	
Large Rock: 17%	Overstory: 1%	Overstory height: 6 m/9 m
Small Rock: 26%	Shrub: 7%	Shrub height: 10 cm/1.3 m
Bare/Fine: 50%	Herbaceous: <1%	Herbaceous height: 1 cm
Litter: <1%	Total: 8%	
Large Rock: 52%	Overstory: 1%	Overstory height: 6 m/00 m
Small Rock: 31%	Shrub: 10%	Shrub height: 5 cm/0.5 m
Bare/Fine: 7%	Herbaceous: <1%	Herbaceous height: 7 cm
Litter: < 1%	Total: 10%	
Large Rock: 15%	Overstory: 1%	Overstory height: 5 m/6 m
Small Rock: 45%	Shrub: 4%	Shrub height: 2 cm/0.7 m
Bare/Fine: 35%	Herbaceous: <1%	Herbaceous height: 1cm
Litter: <1%	Total: 5%	

Description: Wadi bed consists of a coarse sand substrate with granite geology and basalt dykes. The topography of the wadi is concave and the slope exposure varies from flat to northwest (314°, 352°) to northeast (20°). The wadi orientation varies from the southeast (150°, 172°) to north (358°, 0°). The width of the wadi ranges from 25 meters to 75 meters. The steepness of the wadi bed ranges from 1-25%. The vegetation is dominated by young individuals *Phoenix dactylifera*, *Chiliadenus montanus*, and *Fagonia mollis*. There is a high diversity and cover of species in this wadi. The tree component is 6-24 inches dbh and is over 20 feet high. The herbaceous component is less than 12 inches in height. There is moderate to high disturbance impacts from grazing to human disturbance from Bedouin gardens and wells.

Plant List:

Strata	Plant	Cover
Tall	<i>Ceratonia siliqua</i>	<1
Tall	<i>Phlomis aurea</i>	1
Tall	<i>Phoenix dactylifera</i>	2
Medium	<i>Achillea fragrantissima</i>	1
Medium	<i>Artemisia judaica</i>	<1
Medium	<i>Asclepias sinaica</i>	<1
Medium	<i>Capparis spinosa</i>	<1
Medium	<i>Chiliadenus montanus</i>	1
Medium	<i>Colutea istria</i>	<1
Medium	<i>Deverra tortuosa</i>	<1
Medium	<i>Deverra triradiata</i>	<1
Medium	<i>Ficus sp.</i>	<1
Medium	<i>Hyoscyamus boveanus</i>	<1
Medium	<i>Lavendula coronipifolia</i>	1
Medium	<i>Ochradenus baccatus</i>	<1
Medium	<i>Organum syricum-sinaicum</i>	<1

Medium	<i>Pulicaria undulata</i>	1
Medium	<i>Tanacetum sinaicum</i>	<1
Medium	<i>Verbascum sinaiticum</i>	<1
Low	<i>Alkanna orientalis</i>	<1
Low	<i>Anarrhinum pubescens</i>	<1
Low	<i>Androchne aspera</i>	<1
Low	<i>Artemisia herba-alba</i>	<1
Low	<i>Atriplex leucoclada var. turcomanica</i>	<1
Low	<i>Caylusea hexagyna</i>	<1
Low	<i>Citrullus colocynthis</i>	<1
Low	<i>Cleome arabica</i>	<1
Low	<i>Cynodon dactylon</i>	<1
Low	<i>Diplotaxis harra</i>	<1
Low	<i>Echinops glabberimus</i>	<1
Low	<i>Euphorbia sp.</i>	<1
Low	<i>Fagonia arabica</i>	<1
Low	<i>Fagonia brugueri</i>	<1
Low	<i>Fagonia mollis</i>	1
Low	<i>Filago sp.</i>	<1
Low	<i>Galium sinaica</i>	<1
Low	<i>Glaucium arabica</i>	<1
Low	<i>Hypericum arabicum</i>	<1
Low	<i>Iphiaea mucronata</i>	<1
Low	<i>Isatis lusitanica</i>	<1
Low	<i>Juncus sp.</i>	<1
Low	<i>Kickxia acerbiana</i>	<1
Low	<i>Kickxia aegyptiaca</i>	<1
Low	<i>Lotononis platycarpa</i>	<1
Low	<i>Matthiola arabica</i>	<1
Low	<i>Mentha longifolia</i>	<1
Low	<i>Peganum harmala</i>	<1
Low	<i>Reseda pruinosa</i>	<1
Low	<i>Solanum sp.</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Teucrium leucocladum</i>	<1
Low	<i>Teucrium polium</i>	<1
Low	<i>Zilla spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
camel	2	2
donkey	2	4
donkey	3	6
fox	2	1
goat	2	28.5
goat	3	37.11111111
goat	4	42.75

Nasb

Date: 27/6/06, 28/6/06

Location: 34°07.544 E, 28°29.810 N, 1235 meters
 34°06.968 E, 28°29.211 N, 1289 meters
 34°06.470 E, 28°28.732 N, 1319 meters

Coverages:

Large Rock: 2%	Overstory: 0%	Overstory height: 0 m/0 m
Small Rock: 97%	Shrub: 6%	Shrub height: 10 cm/1.0 m
Bare/Fine: <1%	Herbaceous: <1%	Herbaceous height: 8 cm
Litter: 1%	Total: 7%	

Large Rock: 5%	Overstory: 0%	Overstory height: 0 m/0 m
Small Rock: 75%	Shrub: 9%	Shrub height: 30 cm/2.3 m
Bare/Fine: 20%	Herbaceous: 2%	Herbaceous height: 8 cm
Litter: 0%	Total: 11%	

Large Rock: 9%	Overstory: 0%	Overstory height: 0 m/0 m
Small Rock: 85%	Shrub: 22%	Shrub height: 30 cm/2.3 m
Bare/Fine: 6 %	Herbaceous: <1%	Herbaceous height: 8 cm
Litter: 1%	Total: 23%	

Description: Wadi bed consists of coarse sand to gravel with a combination of granite and sandstone geology. The topography of the wadi bed is concave. The wadi bed is flat overall, but has a steepness of 1-5% in areas. The orientation of the wadi varies widely, with orientations from northwest (243°) to north (0°) to northeast (20°). The width of the wadi is also highly variable, ranging from 20 meters to 150 meters. Mature individuals of Tamarisk sp., Retama raetam, and Artemisia judaica dominate the vegetation. The tree component is 1-6 inches dbh and the herbaceous component is less than 12 inches in height. There are moderate disturbance impacts from vehicles and grazing.

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	3
Tall	<i>Tamarisk sp.</i>	2
Medium	<i>Artemisia judaica</i>	13
Medium	<i>Chiliadenus montanus</i>	<1
Medium	<i>Zygophyllum coccineum</i>	<1
Low	<i>Achillea fragrantissima</i>	<1
Low	<i>Aerva javanica</i>	1
Low	<i>Blepharis edulis</i>	<1
Low	<i>Capparis spinosa</i>	<1
Low	<i>Citrullus colocynthis</i>	<1
Low	<i>Fagonia mollis</i>	<1
Low	<i>Gymnocarpus decandrus</i>	<1
Low	<i>Hyoscyamus boveanus</i>	<1

Low	<i>Launea spinosa</i>	1
Low	<i>Ochradenus baccatus</i>	<1
Low	<i>Peganum harmala</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Teucrium polium</i>	<1

Dung:

Animal	Age Category	Average Number
camel	3	3
camel	5	6
donkey	3	3
donkey	4	4
goat	3	32.5
goat	4	13.5
goat	5	230.5

Nawamis

Date: 30/6/06

Location: 34°05.649 E, 28°28.029 N, 1378 meters
34°05.750 E, 28°28.075 N, 1365 meters

Coverages:

Large Rock: 12%

Small Rock: 88%

Bare/Fine: <1%

Litter: <1%

Overstory: 0%

Shrub: 13%

Herbaceous: 0%

Total: 13%

Overstory height: 0 m/0 m

Shrub height: 10 cm/2.7 m

Herbaceous height: 0 cm

Large Rock: 37%

Small Rock: 62%

Bare/Fine: <1%

Litter: 1%

Overstory: 2%

Shrub: 9%

Herbaceous: 0%

Total: 9%

Overstory height: 5.0 m/5.5 m

Shrub height: 10 cm/3.3 m

Herbaceous height: 0 cm

Description: Wadi bed consists of medium sized gravel with granite and basalt geology. The topography of the wadi is concave to undulating. The slope has a southeastern exposure to flat. The wadi bed orientation varies from north (2°) to northwest (280°), the width varies from 50 meters to 200 meters. The steepness of the wadi bed is 1-5%. The habitat characteristics of this wadi vary greatly. In areas, the water channel is distinct while in other areas it is more of an open farsh system. However, the vegetation remains to be dominated by the same species, mature and decadent individuals of *Retama raetam*, *Artemisia judaica*, and *Achillea fragrantissima*. There is no herbaceous component. The disturbance within this wadi range from moderate to low grazing impacts and moderate impacts due to vehicle use.

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	4
Medium	<i>Achillea fragrantissima</i>	1
Medium	<i>Artemisia judaica</i>	8

Medium	<i>Zilla spinosa</i>	<1
Low	<i>Anabasis articulata</i>	<1
Low	<i>Artemisia herba-alba</i>	<1
Low	<i>Ballota undulata</i>	<1
Low	<i>Fagonia mollis</i>	<1
Low	<i>Kickxia aegyptiaca</i>	<1
Low	<i>Launea spinosa</i>	<1
Low	<i>Reaumuria hirtella</i>	<1

Dung:

Animal	Age Category	Average Number
camel	5	11.25
donkey	5	1
goat	2	9
goat	4	168.5
goat	5	90.5
rabbit	4	12

Shagg Tinia

Date: 2/8/06

Location: 33°54.933 E, 28°35.567 N, 1379 meters

Coverages:

Large Rock: 47%

Small Rock: 21%

Bare/Fine: 25%

Litter: 1%

Overstory: 2%

Shrub: 5%

Herbaceous: <1%

Total: 7%

Overstory height: 5.0 m/5.5 m

Shrub height: 10 cm/0.7 m

Herbaceous height: 1 cm

Description: Wadi bed consists of a medium sand substrate with pink granite geology. The topography of the wadi varies from concave to undulating and the slope exposure is northeast (78°). The wadi bed is orientated to the southwest (242°), is approximately 15 meters wide and has a steepness of 1-5%. The survey site is located at the junction of Wadi Shagg and Wadi Tinia, and consists of a narrow water channel with large boulders. Young individuals of *Phoenix dactylifera*, *Ficus sp.*, and *Chiliadenus montanus* dominate the vegetation. The herbaceous layer is less than 12 inches in height and the tree component is 11-24 inches dbh and 10-20 feet in height. There is moderate to high amounts of disturbance occurring from Bedouin gardens and grazing.

Plant List:

Strata	Plant	Cover
Tall	<i>Ficus sp.</i>	<1
Tall	<i>Phoenix dactylifera</i>	2
Medium	<i>Achillea fragrantissima</i>	<1
Medium	<i>Asclepias sinaica</i>	<1
Medium	<i>Capparis sinaica</i>	<1
Medium	<i>Chiliadenus montanus</i>	2
Medium	<i>Hyoscyamus boveanus</i>	<1
Medium	<i>Lavendula coronipifolia</i>	<1
Medium	<i>Origanum syricum-sinaicum</i>	<1

Medium	<i>Pulicaria undulata</i>	<1
Low	<i>Alkanna orientalis</i>	<1
Low	<i>Androchne aspera</i>	<1
Low	<i>Artemisia herba-alba</i>	<1
Low	<i>Caylusea hexagyna</i>	<1
Low	<i>Citrullus colocynthis</i>	<1
Low	<i>Cynodon dactylon</i>	<1
Low	<i>Diploaxis harra</i>	<1
Low	<i>Echinops glabberimus</i>	<1
Low	<i>Fagonia brugueri</i>	<1
Low	<i>Fagonia mollis</i>	1
Low	<i>Matthiola arabica</i>	<1
Low	<i>Ochradenus baccatus</i>	<1
Low	<i>Phlomis aurea</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Teucrium polium</i>	<1
Low	<i>Zilla spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
goat	2	1
goat	3	28
goat	5	32

Sulaf

Date: 20/7/06

Location: 33°52.695 E, 28°38.031 N, 1145 meters

Coverages:

Large Rock: 55%

Small Rock: 39%

Bare/Fine: <1%

Litter: <1%

Overstory: 0%

Shrub: 6%

Herbaceous: 0%

Total: 6%

Overstory height: 0 m/0 m

Shrub height: 10 cm/2.0 m

Herbaceous height: 0 cm

Description: Wadi bed consists of a gravel substrate with granite geology. The topography of the wadi is concave with a northeastern (45°) slope exposure. The wadi bed is orientated to the southwest (226°), is approximately 10 meters wide, and has a steepness of 1-5%. The wadi bed can be characterized as being very narrow with large granite boulders. Young individuals of *Retama raetam* and *Zilla spinosa* dominate the vegetation. There is a low amount of disturbance from grazing. Wadi Hibran is located to the southeast (150°) and Wadi Gharba is located to the northeast (50°).

Plant List:

Strata	Plant	Cover
Tall	<i>Retama raetam</i>	2
Medium	<i>Gymnocarpus decandrus</i>	<1
Medium	<i>Haloxylon scoparium</i>	1
Medium	<i>Launea spinosa</i>	<1

Medium	<i>Lycium schfurtii</i>	<1
Medium	<i>Lycium shawii</i>	<1
Medium	<i>Ochradenus baccatus</i>	1
Medium	<i>Zilla spinosa</i>	2
Low	<i>Cleome arabica</i>	<1
Low	<i>Fagonia mollis</i>	1
Low	<i>Heliotropium digynum</i>	<1
Low	<i>Reseda pruinosa</i>	<1
Low	<i>Teucrium polium</i>	<1

Dung:

Animal	Age Category	Average Number
donkey	3	9
goat	2	12
goat	3	6
goat	5	79
sheep	5	4

High Elevation Wadi's

Ahmer

Date: 26/7/06

Location: 33°56.452 E, 28°31.726 N, 1928 meters

Coverages:

Large Rock: 65%

Overstory: 0%

Overstory height: 0 m/0 m

Small Rock: 20%

Shrub: 12%

Shrub height: 0.3 m/1.3 m

Bare/Fine: 5%

Herbaceous: 5%

Herbaceous height: 30 cm

Litter: <1%

Total: 17%

Description: Wadi bed consists of a coarse sand to fine gravel substrate with granite geology. The topography of the wadi is convex and undulating. The slope exposure is variable from northwest (340°) to southeast (160°). The wadi bed is orientated northeast (80°), is approximately 20 meters wide, and has a 5-25% slope. Mature individuals of *Cretagus sinaica* and *Phlomis aurea* dominate the vegetation. The wadi seems to have high moisture content. There is a high diversity of species and excellent plant health. There is a low amount of disturbance occurring in this wadi, with slight impacts from grazing and human impacts.

Plant List:

Strata	Plant	Cover
Tall	<i>Cretagus sinaica</i>	1
Medium	<i>Chiliadenus montanus</i>	2
Medium	<i>Globularia arabica</i>	<1
Medium	<i>Nepeta septemcrenata</i>	<1
Medium	<i>Phlomis aurea</i>	5
Medium	<i>Pterocephalus sanctus</i>	<1
Medium	<i>Stachys aegyptiaca</i>	3

Medium	<i>Tancetum sinaica</i>	1
Low	<i>Anharrinum pubescens</i>	1
Low	<i>Artemisia herba-alba</i>	<1
Low	<i>Bufonia multiceps</i>	<1
Low	<i>Deverra tortuosa</i>	<1
Low	<i>Echinops glabberimus</i>	<1
Low	<i>Galium sinaica</i>	<1
Low	<i>Hypericum sinaicum</i>	1
Low	<i>Isatis lusitanica</i>	<1
Low	<i>Juncus sp.</i>	<1
Low	<i>Mentha longifolia</i>	<1
Low	<i>Origanum syricum-sinaicum</i>	1
Low	<i>Plantago sinaica</i>	<1
Low	<i>Pseudognaphalium luteoalbum</i>	<1
Low	<i>Pulicaria inuloides</i>	1
Low	<i>Scariola orientalis</i>	<1
Low	<i>Stipagrostis ciliata</i>	<1
Low	<i>Teucrium polium</i>	<1
Low	<i>Thymus decussatus</i>	<1
Low	<i>Verbascum sinaica</i>	<1

Dung:

Animal	Age Category	Average Number
donkey	3	29
goat	4	8
goat	5	80

Ghazna

Date: 26/7/06

Location: 33°56.240 E, 28°31.290 N, 1907 meters

Coverages:

Large Rock: 53%

Small Rock: 11%

Bare/Fine: 25%

Litter: <1%

Overstory: 0%

Shrub: 11%

Herbaceous: 0%

Total: 11%

Overstory height: 0 m/0 m

Shrub height: 3 cm/1.3 m

Herbaceous height: 0 cm

Description: Wadi bed consists of a coarse sand to fine gravel substrate with pink granite geology. The topography is undulating with a variable slope exposure. The wadi is orientated southeast (140°), is approximately 75 meters wide, and has a 1-5% slope. Transects were done in three different water channels separated by large boulders. Young individual of *Achillea fragrantissima*, *Phlomis aurea*, and *Alkanna orientalis* dominates vegetation. There is moderate disturbance from grazing animals.

Plant List:

Strata	Plant	Cover
Tall	<i>Phlomis aurea</i>	2
Medium	<i>Achillea fragrantissima</i>	4
Medium	<i>Chiliadenus montanus</i>	1
Medium	<i>Deverra tortuosa</i>	<1

Medium	<i>Nepeta septemcrenata</i>	<1
Medium	<i>Tancetum sinaica</i>	<1
Low	<i>Alkanna orientalis</i>	1
Low	<i>Anharrinum pubescens</i>	<1
Low	<i>Artemisia herba-alba</i>	<1
Low	<i>Astragalus vogelii</i>	<1
Low	<i>Ballota undulata</i>	<1
Low	<i>Bufonia multiceps</i>	<1
Low	<i>Diploaxis harra</i>	<1
Low	<i>Echinops glabberimus</i>	<1
Low	<i>Euphorbia peplus</i>	1
Low	<i>Galium sinaica</i>	<1
Low	<i>Globularia arabica</i>	<1
Low	<i>Lotononis platycarpa</i>	<1
Low	<i>Plantago sinaica</i>	1
Low	<i>Pseudognaphalium luteoalbum</i>	<1
Low	<i>Pterocephalus sanctus</i>	<1
Low	<i>Scariola orientalis</i>	<1
Low	<i>Scrophularia deserti</i>	<1
Low	<i>Teucrium polium</i>	<1
Low	<i>Verbascum sinaitcum</i>	<1
Low	<i>Zilla spinosa</i>	<1

Dung:

Animal	Age Category	Average Number
camel	3	5
donkey	3	21
donkey	4	2
donkey	5	32
goat	5	160

Hreza

Date: 27/7/06

Location: 33°56.499 E, 28°32.070 N, 1939 meters

Coverages:

Large Rock: 20%

Small Rock: 54%

Bare/Fine: 13%

Litter: 1%

Overstory: 0%

Shrub: 12%

Herbaceous: 0%

Total: 12%

Overstory height: 0 m/0 m

Shrub height: 3 cm/.77 m

Herbaceous height: 0 cm

Description: Farsh consists of a coarse sand substrate with granite geology. The topography varies from flat to concave. The slope exposure varies from northwest (312°) to southeast (132°). The wadi bed is approximately 50 meters wide, is orientated north (16°), and has a 1-5% slope. Wadi can be characterized as a farsh system at the top of a sloped habitat. Young individuals of *Tancetum sinaica* and *Zilla spinosa* dominate vegetation. There is heavy disturbance from grazing animals, primarily goats and

donkeys. Many plants are grazed to the base. Wadi Ahmer is located to the southeast (120°) and Wadi Shagg is located to the southwest (220°).

Plant List:

Strata	Plant	Cover
Tall	<i>Phlomis aurea</i>	<1
Medium	<i>Chiliadenus montanus</i>	2
Medium	<i>Deverra triradiata</i>	<1
Medium	<i>Globularia arabica</i>	<1
Medium	<i>Pulicaria undulata</i>	1
Medium	<i>Tancetum sinaica</i>	3
Low	<i>Artemisia herba-alba</i>	<1
Low	<i>Echinops glabberimus</i>	<1
Low	<i>Gymnocarpus decandrus</i>	<1
Low	<i>Isatis lusitanica</i>	<1
Low	<i>Matthiola arabica</i>	<1
Low	<i>Plantago sinaica</i>	<1
Low	<i>Scariola orientalis</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Teucrium polium</i>	<1
Low	<i>Zilla spinosa</i>	1

Dung:

Animal	Age Category	Average Number
donkey	4	4
donkey	5	19
goat	5	122.5

Omgraf

Date: 28/7/06

Location: 33°55.998 E, 28°31.563 N, 1922 meters

Coverages:

Large Rock: 30%	Overstory: 0%	Overstory height: 0 m/0 m
Small Rock: 53%	Shrub: 9%	Shrub height: 3 cm/1.5 m
Bare/Fine: 15%	Herbaceous: <1%	Herbaceous height: 8 cm
Litter: 3%	Total: 9%	

Description: Wadi bed consists of a coarse sand substrate with pink granite geology. The topography is concave with a northeastern (72°) slope exposure. The wadi bed has a 1-5% incline and is orientated southwest (228°). The water channel is approximately 15 meters wide. Young individuals of *Phlomis aurea*, *Tancetum sinaicum*, and *Teucrium leuocladum* dominate the vegetation. Wadi Ghazna is located to the southeast (150°) and Wadi Shagg is located to the east (90°). There is a high amount of disturbance from Bedouin gardens and moderate amounts of grazing disturbance, especially on *Tancetum sinaica*.

Plant List:

Strata	Plant	Cover
Tall	<i>Phlomis aurea</i>	<1

Medium	<i>Achillea fragrantissima</i>	<1
Medium	<i>Chiliadenus montanus</i>	<1
Medium	<i>Tanacetum sinaica</i>	2
Medium	<i>Zilla spinosa</i>	<1
Low	<i>Alkanna orientalis</i>	1
Low	<i>Anharrinium pubescens</i>	<1
Low	<i>Bufonia multiceps</i>	<1
Low	<i>Caylusea hexagyna</i>	<1
Low	<i>Diplotaxis harra</i>	<1
Low	<i>Ephedra aphylla</i>	<1
Low	<i>Galium sinaica</i>	<1
Low	<i>Glaucium arabicum</i>	<1
Low	<i>Juncus sp.</i>	<1
Low	<i>Lactuca orientalis</i>	<1
Low	<i>Plantago sinaica</i>	1
Low	<i>Stachys aegyptiaca</i>	1
Low	<i>Teucrium leucocladum</i>	3
Low	<i>Teucrium polium</i>	<1

Dung:

Animal	Age Category	Average Number
donkey	2	21
donkey	4	18

Shagg

Date: 25/7/06

Location: 33°56.183 E, 28°31.640 N, 1892 meters

Coverages:

Large Rock: 40%

Small Rock: 15%

Bare/Fine: 33%

Litter: <1%

Overstory: 0%

Shrub: 12%

Herbaceous: 0%

Total: 12%

Overstory height: 0 m/0 m

Shrub height: 8 cm/0.5 m

Herbaceous height: 0 cm

Description: Wadi bed consists of a fine sand to silt substrate with pink granite geology. Topography of the wadi is undulating with a variable slope exposure. The steepness of the wadi ranges from 1-5%. The orientation of the wadi bed is south (184°) and is approximately 100 meters wide. The wadi consists of several water channels; it appears that there has been recent water action. There is a high plant cover of young *Achillea fragrantissima* along with *Zilla spinosa*. There is a moderate amount of human disturbance from litter and an established footpath along with moderate disturbance from grazing animals.

Plant List:

Strata	Plant	Cover
Tall	<i>Phlomis aurea</i>	<1
Medium	<i>Achillea fragrantissima</i>	9
Medium	<i>Deverra tortuosa</i>	<1
Medium	<i>Glaucium arabicum</i>	<1

Medium	<i>Zilla spinosa</i>	1
Low	<i>Artemisia herba-alba</i>	<1
Low	<i>Ballota undulata</i>	<1
Low	<i>Bufonia multiceps</i>	<1
Low	<i>Diploaxis harra</i>	<1
Low	<i>Echinops glabberimus</i>	<1
Low	<i>Euphorbia peplus</i>	1
Low	<i>Galium sinaica</i>	<1
Low	<i>Lactuca orientalis</i>	<1
Low	<i>Plantago sinaica</i>	<1
Low	<i>Stachys aegyptiaca</i>	<1
Low	<i>Teucrium polium</i>	<1

Dung:

Animal	Age Category	Average Number
camel	3	1
donkey	2	18
donkey	5	2
goat	5	35.5

Zewatein

Date: 27/7/06

Location: 33°55.712 E, 28°32.300 N, 1841 meters

Coverages:

Large Rock: 15%

Small Rock: 50%

Bare/Fine: 25%

Litter: <1%

Overstory: 0%

Shrub: 10%

Herbaceous: <1%

Total: 11%

Overstory height: 0 m/0 m

Shrub height: 2 cm/1.3 m

Herbaceous height: 15 cm

Description: Wadi bed consists of a coarse sand substrate with granite geology. Wadi has a concave topography with a southwestern (246°) slope exposure. The steepness of the wadi ranges from 5-25%. The wadi bed is orientated 346° and is approximately 25 meters wide. Vegetation is dominated by young *Achillea fragrantissima*, *Phlomis aurea*, and *Stachys aegyptiaca*. The herbaceous component is less than 12 inches in height. Wadi bed is adjacent to Bedouin garden with a footpath along the top of wadi channel. There is also moderate disturbance from grazing occurring.

Plant List:

Strata	Plant	Cover
Tall	<i>Phlomis aurea</i>	1
Medium	<i>Achillea fragrantissima</i>	3
Medium	<i>Chiliadenus montanus</i>	1
Medium	<i>Tanacetum sinaica</i>	<1
Medium	<i>Verbascum sinaiticum</i>	<1
Low	<i>Alkanna orientalis</i>	<1
Low	<i>Anharrinum pubescens</i>	<1

Low	<i>Artemisia herba-alba</i>	<1
Low	<i>Asclepias sinaica</i>	<1
Low	<i>Caylusea hexagyna</i>	<1
Low	<i>Deverra tortuosa</i>	<1
Low	<i>Diploaxis harra</i>	<1
Low	<i>Euphorbia peplus</i>	<1
Low	<i>Fagonia arabica</i>	<1
Low	<i>Fagonia brugeri</i>	<1
Low	<i>Fagonia mollis</i>	<1
Low	<i>Galium sinaica</i>	<1
Low	<i>Helianthum ellipticum</i>	<1
Low	<i>Matthiola arabica</i>	<1
Low	<i>Mentha longifolia</i>	<1
Low	<i>Mentha longifolia</i>	<1
Low	<i>Origanum syricum-sinaicum</i>	<1
Low	<i>Plantago sinaica</i>	<1
Low	<i>Pulicaria inuloides</i>	<1
Low	<i>Pulicaria undulata</i>	<1
Low	<i>Scariola orientalis</i>	<1
Low	<i>Stachys aegyptiaca</i>	2
Low	<i>Teucrium leucocladum</i>	<1
Low	<i>Teucrium polium</i>	<1

Dung:

Animal	Age Category	Average Number
donkey	1	1
donkey	5	5
goat	4	28
goat	5	59.5