

Project Update: September 2018

Over the past couple of months, our team has strengthened collaborations with various researchers involved, added new collaborations to our project, and maintained our ongoing collection efforts for wolf samples.

June 2018

- Collection efforts by regional teams continued throughout June. Each team shipped samples periodically to the Department of Wildlife Management at PMAS Arid Agricultural University where sample database of Wolf Pak Project is being updated periodically.
- Our collaborators at the Mammalian Ecology and Conservation Unit at University of California, Davis (UC Davis) have sequenced the cytochrome B and D-loop of field scat samples. Table 1 shows the samples sequenced and the molecular identification of wolf samples



Figure 1: Hira Fatima, Lauren Hennelly & Dr Tariq

July 2018

- Our collaborator at UC Davis, Lauren Hennelly, visited Pakistan in July (Figure 1). Lauren and I met with our project team at PMAS Arid Agricultural University in Rawalpindi, including Dr. Tariq Mahmood, Abdul Hameed (completed his masters on wolf ecology in South Waziristan), and M. Raza Khan (a masters student studying wolf ecology in Swat Valley).
- We discussed current conservation issues with wolf conservation in the South Waziristan and Swat Valley. Ongoing collection is going on in these regions.
- We approached Punjab Wildlife and Parks Department for seeking permission



Figure 2: Wolf from Murghzar Zoo

on collection of blood samples of wolves' specimen from Punjab zoos (i.e. Lahore Zoo, Dera Ghazi Khan Zoo, and Bahawalpur Zoo)

- We developed questionnaire regarding the information of zoo specimens, which would accompany every blood sample.
- While her stay at Islamabad we planned a visit to Murghzar Zoo, Islamabad where they have five wolves (Figure 2). We discussed our project with zoo management and they agreed to give us blood sample in exchange with some laboratory blood tests (i.e. blood CP, blood parasite) for each specimen.

Gilgit-Baltistan Tour

- Lauren and I traveled together to the Karakoram International University (KIU) in Gilgit to meet Dr. M Zafar Khan, an assistant professor at KIU. We discussed further plans of the project and sample collection in the Gilgit-Baltistan region.
- On our way From Gilgit to Deosai National Park we saw some activity signs (pictures below) and news of wolf activity from locals at Skardu Forest Plantation Area near Indus River. We Installed camera traps but due to tight schedule and shortage of time couldn't get positive results.



- We visited field sites in Deosai National Park and met our collaborator Mehdi Sadpara. With Medhi, we discussed the ways though which we can maximise our data collection efforts and distributed more sampling tubes to Deosai National Park.
- Lauren and I also visited Lahore zoo and discussed our project with Zoo Director Hassan Ali Sukhera. We will be signing a MoU with the Lahore Zoo to allow further collaboration on the project. Blood sampling will be done on the Lahore Zoo wolves as well as other zoo wolves in Punjab. Currently, there is a Masters student working in the Dera Ghazi Khan area of Punjab. Our project will be collaborating with this student to help with molecular identification of wolves.



Hira Fatima, Medhi Sadpara, and Lauren Hennelly in Deosai National Park.

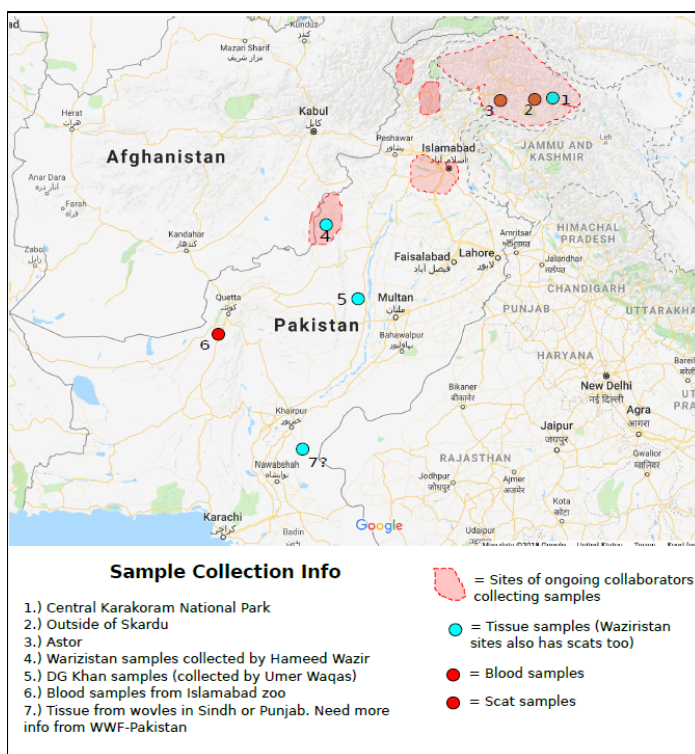
August 2018

- I was approached by another Rufford grant awardee (Mohammad Asad) who is also working in Pakistan on **Subspecies Status and Distribution of Leopards in Pakistan** and we both agreed on collaboration and sharing of data bilaterally. He shared some data of wolf activity (below)
- BWEDO did the courtesy of sharing some old photographs of wolves from Gilgit Baltistan



Pug marks of wolf in Mankial, Swat.

- For the genetic analysis of this current batch of Pakistan wolf scat, the next shipment is ready to dispatch to UC Davis Mammalian Ecology and Conservation Unit, USA.
- Genetic analyses from our last batch of wolf samples have contributed to Abdul Hameed's master's thesis. The results of his master's research and our genetic analysis has been written into a manuscript titled "*Distribution, diet, and human conflict of grey wolf (Canis lupus) in Suleiman range, South Waziristan, Pakistan*". This manuscript is currently under revision after being submitted to the international journal *Mammalia*.



Pakistan sample map.

Table 1. Samples that have been sequenced and the mtDNA D loop results at the University of California, Davis

Sample ID	Sample type	Site	Date Collected	Collector	D-loop sequence results
S17-6398	Scat	MHNP	20162212	Hira Fatima	Dog
S17-6414	Scat	MHNP	20170211	Hira Fatima	Dog
S17-6432	Scat	MHNP	20170307	Hira Fatima	Dog
S17-6445	Scat	MHNP	20170320	Hira Fatima	Dog
S17-6448	Scat	MHNP	20170320	Hira Fatima	Dog
S17-6454	Scat	MHNP	20170402	Hira Fatima	Dog
S17-6508	Scat	S.Waziristan Raghazai	20170305	Abdul Hameed	Wolf
S17-6509	Scat	S.Waziristan Raghazai	20170305	Abdul Hameed	Wolf
S18-0220	Scat	Kalam Mahoodand (Swat)	20180125	Raza Khan	Dog
S18-0230	Scat	Kalam Mahoodand (Swat)	20171124	Raza Khan	Dog
S18-0231	Scat	Astor (GB)	20171218	Amjad Khan	Wolf
S18-0233	Scat	Hotoo Skardu	20171221	Mehdi Sadpara	Dog
S18-0237	Scat	Sadpara Skardu	20171216	Mehdi Sadpara	Wolf
S18-0239	Scat	Sadpara Skardu	20171216	Mehdi Sadpara	Wolf
S18-0241	Scat	Sadpara Skardu	20171216	Mehdi Sadpara	Wolf
S18-0242	Scat	Sadpara Skardu	20171216	Mehdi Sadpara	Wolf
S18-0243	Scat	Sadpara Skardu	20171216	Mehdi Sadpara	Wolf
S18-0244	Scat	Sadpara Skardu	20171216	Mehdi Sadpara	Wolf
S18-0245	Scat	Sadpara Skardu	20171216	Mehdi Sadpara	Wolf
S18-0247	Scat	Sadpara Skardu	20171216	Mehdi Sadpara	Wolf
S18-0256	Scat	Shigar CKNP	20180111	Yasir Abbas	Wolf
S18-0257	Scat	Shigar CKNP	20180111	Yasir Abbas	Wolf
S18-0260	Scat	Shigar CKNP	20180112	Yasir Abbas	Wolf

Final-sample-ID	Sample type	Site	Lat (N)	Lon (E)	Elevation (M)	FieldID		Collector	Age/pelage	sex	Sp	Dup	Fresh?	storage	logged by	Comment
	Scat	Torik valley	35°38.07'N	75°18.272'E	2755		13-01-18	Yasir Abbas					ethanol			
	Scat	Torik valley	35°38.080'N	75°18.081'E	3000		13-01-18	Yasir Abbas					ethanol			
	Scat	Torik valley	35°40.261'N	75°16.160'E	2971		13-01-18	Yasir Abbas					ethanol			
	Scat	ASTK valley	35°42.216'N	75°02.055'E	2505		15-01-18	Yasir Abbas					ethanol			
	Scat	ASTK valley	35°41.171'N	75°01.552'E	2470		15-01-18	Yasir Abbas					ethanol			
	Scat	Baghicha	35°35.383'N	75°20.091'E	2209		01-11-18	Yasir Abbas					ethanol			
	Scat	Baghicha	35°35.273'N	75°21.490'E	2507		01-12-18	Yasir Abbas					ethanol			
	Scat	Khora	35°36.311'N	75°20.551'E	2542		13-01-18	Yasir Abbas					ethanol			
	Scat	Khora	35°36.266'N	75°21.221'E	2562		14-01-18	Yasir Abbas					ethanol			
	Scat	Khora	35° 36.61'N	75°20.383'E	2866		13-01-18	Yasir Abbas					ethanol			
	Scat	Shigar	35° 27.59'N	75°40.171'E	7374		19-06-18	Yasir Abbas					ethanol			
	Scat	Shigar	35°27.566'N	75°41.169'E	7310		19-06-18	Yasir Abbas					ethanol			
	Scat	Shigar	35°27.590'N	75°41.130'E	7382		19-06-18	Yasir Abbas					ethanol			
	Scat	Shigar	35°28.011'N	75°41.121'E	7367		19-06-18	Yasir Abbas					ethanol			
	Scat	Shigar	35°28.198'N	75°41.364'E	7477		19-06-18	Yasir Abbas					ethanol			
	Scat	Shigar	35°90.072'	75°40.223	7335		20-06-18	Yasir Abbas					ethanol			

			N	'E													
	Scat	Shigar	35°35.523' N	75°33.491' E	7919		23-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°28.257' N	75°33.393' E	11022		24-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°28.322' N	75°33.426' E	1175		24-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°37.513' N	75°33.384' E	1048		24-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°36.450' N	75°33.408' E	8787		24-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°38.258' N	75°33.380' E	11801		24-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°29.509' N	75°40.386' E	7569		24-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°27.387' N	75°43.096' E	7715		29-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°27.359' N	75°43.073' E	7719		29-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°27.470' N	75°43.090' E	7730		29-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°27.347' N	75°43.072' E	7715		29-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°29.256' N	75°39.699' E	7355		30-06-18	Yasir Abbas						ethanol			
	Scat	Shigar	35°29.256' N	75°39.699' E	7355		30-06-18	Yasir Abbas						ethanol			
	Scat	Bagrote Khaa	36°03.387' N	74°33.574' E	2927		02-02-18	Yasir Abbas						ethanol			
	Scat	Bagrote Khaa	36°04.006' N	74°33.441' E	2985		02-02-18	Yasir Abbas						ethanol			
	Scat	Bagrote Khaa	36°04.052' N	74°33.451' E	3017		02-02-18	Yasir Abbas						ethanol			
	Scat	Hushay (Row)	35°25.473' N	76°21.221' E	3085		02-02-18	Yasir Abbas						ethanol			
	Scat	Hushay (Letayog)	35°26.001' N	76°21.245' E	3142		02-02-18	Yasir Abbas						ethanol			

	Scat	Hushay (Thang)	35°26.555' N	76°21.122' E	3114		02-02-18	Yasir Abbas					ethanol			
	Scat	Hushay (Konggo)	35°28.023' N	76°21.117' E	3267		02-02-18	Yasir Abbas					ethanol			
	Scat	Hushay (Rengbo Shala)	35°28.063' N	76°21.093' E	3227		02-02-18	Yasir Abbas					ethanol			
	Scat	Hushay (Zapoq)	35°28.167' N	76°21.083' E	3324		02-02-18	Yasir Abbas					ethanol			
	Scat	Hushay (Thogas Kong)	35°28.201' N	76°21.116' E	3281		02-02-18	Yasir Abbas					ethanol			
	Scat	Hushay (Sooq)	35°26.401' N	76°20.420' E	3167		02-02-18	Yasir Abbas					ethanol			
	Scat	Hushay (Bahoha)	35°28.077' N	76°20.248' E	3274		02-02-18	Yasir Abbas					ethanol			
KHO 1	Scat	Khora	35°36.237' N	75°22.205' E	3325		08-04-18	Yasir Abbas					ethanol			
KHO 2	Scat	Khora	35°36.237' N	75°22.205' E	3325		08-04-18	Yasir Abbas					ethanol			
KHO 3	Scat	Khora	35°36.237' N	75°22.205' E	3325		08-04-18	Yasir Abbas					ethanol			
KHO 4	Scat	Khora	35°38.275' N	75°16.648' E	3688		08-04-18	Yasir Abbas					ethanol			
TOR 2	Scat	Torik valley	35°38.336' N	75°16.427' E	3790		08-04-18	Yasir Abbas					ethanol			
TOR 2	Scat	Torik valley	35°37.548' N	75°17.411' E	3270		08-04-18	Yasir Abbas					ethanol			
TOR 3	Scat	Torik valley	35°39.101' N	75°16.265' E	3812		08-04-18	Yasir Abbas					ethanol			
TOR 4	Scat	Torik valley	35°39.101' N	75°16.265' E	3812		08-04-18	Yasir Abbas					ethanol			
TOR 5	Scat	Torik valley	35°43.309' N	75°11.439' E	3516		08-04-18	Yasir Abbas					ethanol			
TOR 6	Scat	Torik valley	35°38.107' N	75°19.913' E	3305		08-04-18	Yasir Abbas					ethanol			
TOR 7	Scat	Torik valley	35°38.107' N	75°19.913' E	3305		08-04-18	Yasir Abbas					ethanol			
TOR	Scat	Torik valley	35°42.493' N	75°12.248' E	3364		08-04-18	Yasir Abbas					ethanol			

8			N	'E											
TOR 9	Scat	Torik valley	36°42.493' N	76°12.248' E	3364		08-04-18	Yasir Abbas					ethanol		
KHO 1	Scat	Khora	35°36.246' N	75°22.572' E	3420		08-04-18	Yasir Abbas					ethanol		
KHO 2	Scat	Khora	35°36.257' N	75°22.375' E	3198		08-04-18	Yasir Abbas					ethanol		
KHO 3	Scat	Khora	35°36.224' N	75°22.271' E	3145		08-04-18	Yasir Abbas					ethanol		
KHO 4	Scat	Khora	35°36.308' N	75°22.156' E	3060		08-04-18	Yasir Abbas					ethanol		
TOR 1	Scat	Torik valley	35°38.414' N	75°77.916' E	3324		08-04-18	Yasir Abbas					ethanol		
TOR 2	Scat	Torik valley	35°39.062' N	75°17.078' E	3263		08-04-18	Yasir Abbas					ethanol		
TOR 3	Scat	Torik valley	35°39.563' N	75°18.243' E	3396		08-04-18	Yasir Abbas					ethanol		
	Scat	Fattur Shai Kala Swat (K.P.K)	35°39.743' N	72°40.812' E	8225.066		24-11-17	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°42.426' N	72°38.408' E	9553.806		24-11-17	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°44.042' N	72°38.050' E	9570.21		24-11-17	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°44.119' N	72°38.018' E	9586.614		24-11-17	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°43.405' N	72°38.405' E	9547.244		24-11-17	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°32.543' N	72°40.238' E	7647.638		25-01-18	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°32.539' N	72°40.250' E	7874.016		25-01-18	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°32.528' N	72°40.264' E	7939.633		25-01-18	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°32.529' N	72°40.266' E	7906.824		25-01-18	Raza Khan					ethanol		
	Scat	Kala ahdoodand Area Swat	35°32.528' N	72°40.274' E	7896.982		25-01-18	Raza Khan					ethanol		

	Scat	Kala ahdoondand Area Swat	35°32.528' N	072°40.27 6'E	7890.42		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.518' N	72°40.285 'E	7870.735		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.513' N	72°40.289 'E	7877.297		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.289' N	72°40.289 'E	7877.297		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.507' N	72°40.300 'E	7906.824		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.486' N	72°40.343 'E	7913.386		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.483' N	72°40.353 'E	7903.543		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.446' N	72°40.430 'E	7900.262		25-01-18	Raza Khan					ethanol			
	scat	Kala ahdoondand Area Swat	35°32.349' N	72°40.607 'E	7893.701		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.347' N	72°40.608 'E	7896.982		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.348' N	72°40.605 'E	7893.701		25-01-18	Raza Khan					ethanol			
	Scat	Kala ahdoondand Area Swat	35°32.426' N	72°40.459 'E	7896.982		25-01-18	Raza Khan					ethanol			
	Scat	CGNP (Kandorr Aloteek)	35°52.515' N	71°44.341 'E	7690		28-02-18	Saeed-ul-isla					ethanol			
	Scat	CGNP (Kandorr Aloteek eranGol)	35°52.525' N	71° 44.312'E	7830		28-02-18	Saeed-ul-isla					ethanol			
	Scat	CGNP (Kandorr Aloteek eranGol)	36°52.525' N	72° 44.312'E	7830		28-02-19	Saeed-ul-isla					ethanol			
	Scat	CGNP (Zordi Banghat)	35°52.588' N	71° 44.567'E	6385		03-01-18	Saeed-ul-isla					ethanol			
	Scat	CGNP (Seer oghLatest)	35°53.018' N	71° 45.583'E	8524		03-02-18	Saeed-ul-isla					ethanol			
	Scat	CGNP (Seer oghLatest)	35°53.018' N	71° 45.583'E	8524		03-02-18	Saeed-ul-isla					ethanol			
	Scat	CGNP (Lor	35°45.137'	71°	9220		03-03-18	Saeed-ul-isla					ethanol			

		Kechoteker)	N	45.245'E												
	Scat	CGNP (Lor Kechoteker)	35°45.137' N	71° 45.245'E	9220		03-03-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (Yoor Kach Seerogh Letest)	35°53.138' N	71° 45.329'E	8645		03-04-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (Yoor Kach Seerogh Letest)	35°53.138' N	71° 45.329'E	8645		03-04-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (Pardho ar dai)	35°52.469' N	71° 45.167'E	6830		03-04-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (Pardho ar dai)	35°52.469' N	71° 45.167'E	6830		03-04-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (Pardho ar bonkh)	35°52.488' N	71° 45.179'E	6875		N/G	Saeed-ul-isl					ethanol			
	Scat	CGNP (Pardho ar bonkh)	35°52.488' N	71° 45.179'E	6875		N/G	Saeed-ul-isl					ethanol			
	Scat	CGNP (Chaghoor Gol)	35°53.003' N	71° 45.305'E	7810		03-06-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (Chaghoor Gol)	35°53.003' N	71° 45.305'E	7810		03-06-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (Tosi Bangat)	35°50.196' N	71° 44.397'E	6609		03-08-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (Tosi Bangat)	35°50.196' N	71° 44.397'E	6609		03-08-18	Saeed-ul-isl					ethanol			
	Scat	CGNP (DarwazahKhana)	23°52.432' N	71° 44.595'E	6500		03-09-18	Saeed-ul-isl					ethanol			
	Scat	Hushey (Kongo)	35°28 .201'N	76° 21.116'E	3281	18-Jan	18-01-18	Ghula Ohaad					ethanol			
	Scat	Karabathang (Barbanchan)	35°33.289' N	75°20.529 'E	2193	KRB-01	01-10-18	Ghula Ohaad					ethanol			
	Scat	Karabathang (Rashi Kharfi Kor)	36°33.289' N	75° 20.296'E	2458	Krb-1	01-10-18	Ghula Ohaad					ethanol			
	Scat	Karabathang (Barbanchan)	35°33.290' N	75°20.531 'E	2193	KRB-02	01-10-18	Ghula Ohaad					ethanol			
	Scat	Karabathang (und)	35°33.503' N	75° 20.334'E	2096	3	01-10-18	Ghula Ohaad					ethanol			
	Scat	Skoyo (Nioldoq)	35°34.823' N	75° 15.749'E	2129		21-01-18	Ghula Ohaad					ethanol			

	Scat	Stangokha	35°16.683' N	75° 38.301'E	2369	SKY-1	30-12-17	Ghula Ohaad					ethanol			
	Scat	Skoyo (Choshoqfa)	35°34.634' N	75° 17.420'E	2160	Sky-04	30-12-17	Ghula Ohaad					ethanol			
	Scat	Skoyo (Choshoqfa)	35°34.634' N	75° 17.420'E	2160	Sky-05	30-12-17	Ghula Ohaad					ethanol			
	Scat	Skoyo (Choshoqfa)	35°34.656' N	75° 17.481'E	2180	Sky-06	30-12-17	Ghula Ohaad					ethanol			
	Scat	Skoyo (Hagokha)	35°16.683' N	75° 38.301'E	2369	Sky-02	30-12-17	Ghula Ohaad					ethanol			
	Scat	Karabathang (Guroosa)	35°33.474' N	75° 20.007'E	2438	KRB-2	01-10-18	Ghula Ohaad					ethanol			
	Scat	Skoyo (Chuik)	35°34.632' N	75° 15.749'E	1810	2	21-01-18	Ghula Ohaad					ethanol			
	Scat	Skoyo (Sachili)	35°34.733' N	75° 17.476'E	2255	2	03-03-18	Ghula Ohaad					ethanol			
	Scat	Skoyo (Choshoqfa)	35°34.629' N	75° 17.412'E	2162	1	21-01-18	Ghula Ohaad					ethanol			
	Scat	Skoyo (Nioldoq)	35°23.714' N	75° 17.335'E	2123	Sky-09	31-12-17	Ghula Ohaad					ethanol			
	Scat	Skoyo (Khat)	35°34.670' N	75°17.279 'E	2271	Sky-08	31-12-17	Ghula Ohaad					ethanol			
	Scat	Skoyo (Choshoqfa)	35°34.656' N	75° 17.431'E	2180	Sky-07	30-12-17	Ghula Ohaad					ethanol			
	Scat	Basho (Rangthakkor)	35°28.290' N	75° 18.959'E	3197	Basho-1	23-01-18	Ghula Ohaad					ethanol			
	Scat	Hushay(Ghudonst hrang)	35°30.328' N	76° 21.365'E	3299	Hush 16-18	19-04-18	Ghula Ohaad					ethanol			
	Scat	Hushay (Atosar)	35°31.315' N	76°23.397 'E	3426	Hush 17-18	19-04-18	Ghula Ohaad					ethanol			
	Scat	Hushay (Tisar)	35°30.565' N	76°22.117 'E	3325	Hush 22-18	26-04-18	Ghula Ohaad					ethanol			
	Scat	Hushay (Seicho Pull)	35°31.126' N	76°22.117 'E	3366	Hush 23-18	26-04-18	Ghula Ohaad					ethanol			
	Scat	Hushay	35°28.125' N	76°20.564 'E	3238	Hush	26-04-18	Ghula Ohaad					ethanol			
	Scat	Hushay	35°28.125'	76°20.564	3238	Hush	26-04-18	Ghula Ohaad					ethanol			

			N	'E											
	Scat	Hushay	35°27.409' N	76°20.478' 'E	3148	Hush	28-04-18	Ghula Ohaad					ethanol		
	Scat	Hushay	35°28.080' N	76°20.272' 'E	3271	Hush	28-04-18	Ghula Ohaad					ethanol		
	Scat	S. Wazirsitan					15-02-18	Abdul Haeed					ethanol		
	Scat	S. Wazirsitan					15-02-18	Abdul Haeed					ethanol		
	Scat	S. Wazirsitan					15-02-18	Abdul Haeed					ethanol		
	Scat	S. Wazirsitan					15-02-18	Abdul Haeed					ethanol		
	Scat	S. Wazirsitan					15-02-18	Abdul Haeed					ethanol		
	Scat	Ayubia National Park					04-04-18	Ifra Rafaqat					ethanol		
	Scat	Ayubia National Park					04-04-18	Ifra Rafaqat					ethanol		
	Scat	Ayubia National Park					04-04-18	Ifra Rafaqat					ethanol		
	Scat	Ayubia National Park					04-04-18	Ifra Rafaqat					ethanol		