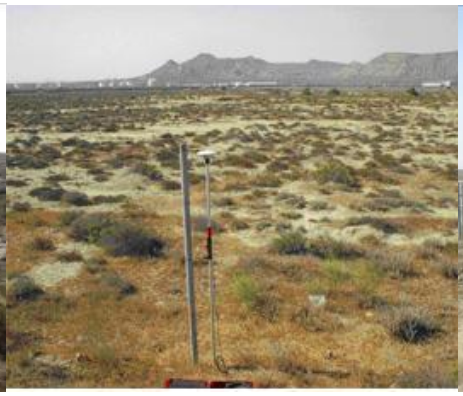
RARE VEGETATION MONITORING IN THE AZERBAIJAN REPUBLIC

Interim Report to Rufford Small Grants Foundation


Prepared by Yelena Gambarova

December 2010

The Rufford Small Grants Foundation
www.ruffordsmallgrants.org

Introduction

This report documents the preliminary achievements by Rufford funded research team in Azerbaijan on planned research activities in the Gobustan State National Park over a period of 5 months, August to December 2010. This report covers the pre-processing and analysis stage of rare vegetation monitoring in Gobustan National Park including Field Survey activities, detailed and updated information about rare vegetation communities. At this stage data on rare vegetation: description/diagnostic character/species distribution and soil types were collected, quality checked and analyzed as own source of information. Site-specific data were collected in the following formats: vegetation survey sample plots, field check sites.
Report on some Education and Public activities undertaken by our team over this period is also presented.

Study area

This study is carried out in Gobustan, located between the southern outcrops of the Caucasus Mountain range and the Caspian Sea, some 60 km south of the capital Baku as in presented in the Figure 1.
The Gobustan semi-desert extends on 1780 km² (178 700 hectares) and is characterized by a semi-arid climate with continental influence and humid, cool winters and dry hot summers.
The Study Area at Gobustan contains a wealth of historical and archaeological sites and is also known for its rare vegetation.

Figure 1. Study Area

The desert communities in the Gobustan State National Park represent the most ecologically important habitat, from a botanic point of view. The great age of many of the desert communities and their slow growth rate further enhance their botanic significance. The importance of this habitat type is one of the reasons that the Gobustan desert has been proposed as a State National Park, so that some level of protection is offered to this desert. Plant communities such as these, which develop very slowly are

particularly susceptible to this disturbance and are easily lost, taking many years to recover (at least 10-12 years).

Project Activities

Hereafter, I present our monthly activities since the grant was awarded to me**.**

At the beginning of the Project working group was held meeting and round-table discussion with project partners and conservation bodies. Visitors were informed about rare vegetation distribution in Gobustan, reasons of extinction and conservation importance and as well the activities before, during and after the project implementation.

Before Field Surveys were conducted, we had compiled relevant botanical information in the project area to provide a regional context for the Project working group. We consulted environmentalist for known occurrences of special status plants and natural communities in the project area prior to field surveys. Generally, identify vegetation and habitat types potentially occurring in the project area based on biological and physical properties of the site and surrounding ecoregion.

The methodological approach of this project includes theoretical and practical training on field identification and the use of standardized monitoring methods using satellite images. For this purpose we contacted the Institute of Botany of Azerbaijan and Azerbaijan National Academy of Sciences to receive necessary information about subject of investigation, climatic data, soil data and topographic maps.
A Specialized GIS was used as software environment for performing workflow comprising of jobs connected with collecting of samples, hosting of classifier training and producing software as well as classification results analysis. Using this software, we created Geographical Data Base (Figure 2) consisting of relevant spatial data (Orthorectified satellite multi-spectral data, ancillary data: various spectral Indexes, DEM and its derivatives as well as vector Topographical data) and Map template. District boundary maps, survey maps and SPOT5 satellite images, vector polygons such as geographical areas of archaeological and historic site were graphical components of GIS Design and Application.

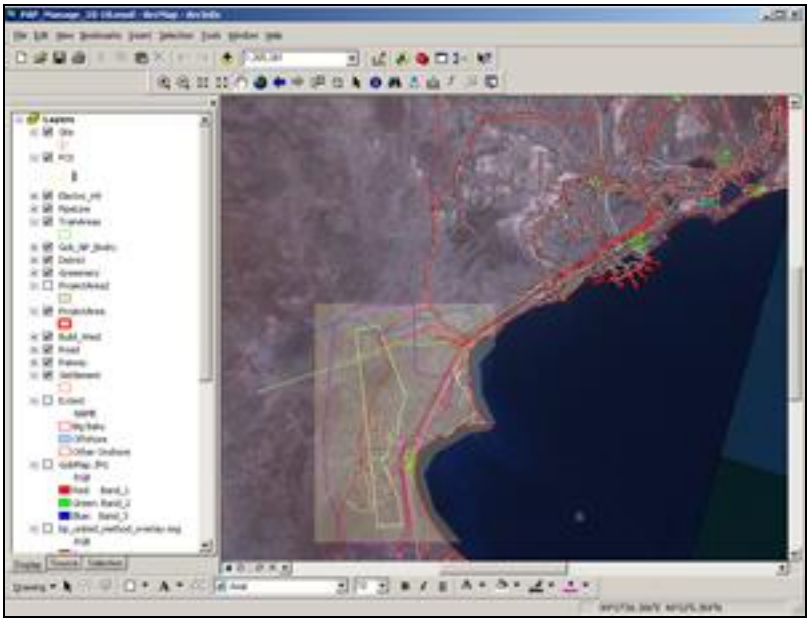


Figure 2. Geographical Data Base

Analysis of the distribution of rare species was focused on an ***Environmentally Sensitive Area*** (ESA) which is a type of designation for agricultural area which needs special protection because of its landscape, wildlife or historical value.

Change in rare vegetation distribution between 2004 and 2007 is focused on Sensitive Area within the Gobustan National Park. The Environmentally Sensitive Area within Gobustan Park was divided into four parts conditionally definable as: North, West, East and South (Figure 3).

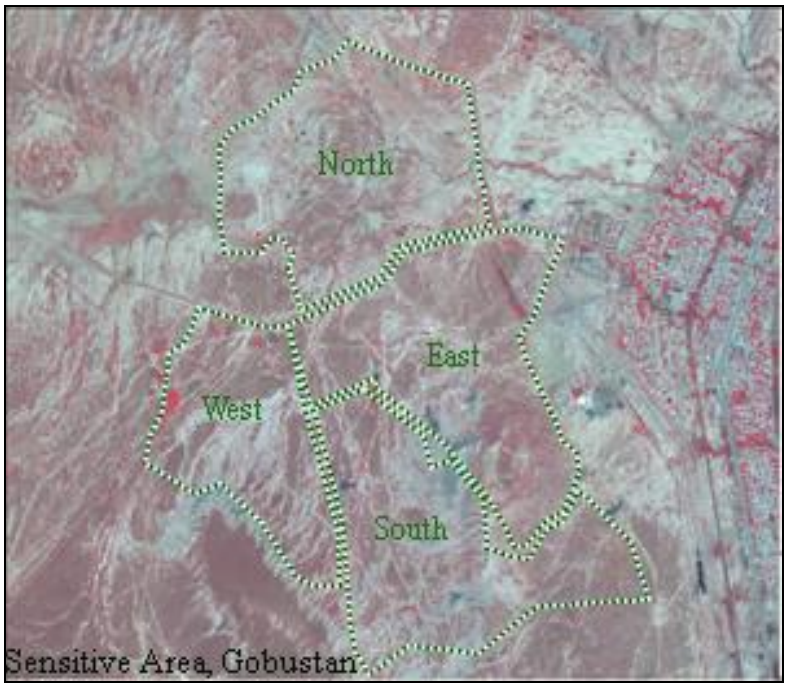


Figure 3. Environmentally Sensitive Area, Gobustan

Field Survey 1, August 2010

The preliminary vegetation survey was undertaken in August 2010.
Because of scattered distribution of vegetation fieldwork activities were done in different locations. Printed map sheets with patch boundaries overlaid on the image, as well ancillary information such as trails, were taken into the field (Figure 4).

Figure 4. Field Survey, Gobustan. Photos by Yelena Gambarova

Because GPS devices provided the coordinates for ground-reference data during fieldwork, the sample plots were accurately linked to SPOT5 imagery. Every plot was registered with GPS device to allow further integration with spatial data in GIS and image processing systems. Field information about different vegetation types and other parameters such as grazing pressure, land-use/cover patterns, general topography of the area and cultivation were also recorded. Data from Field Survey1 was entered into a database (Table 1)**.**

Table 1. Field Survey 1. Sample Plot Proformas

Habitat Type	The name of vegetation communities	Sample plot GPS coordinates
DESERT/SEMI-DESERT	Salsola Nodulosa/ Artemisia Lerchiana	49º21'59.43"E 40º05'52.10"N 49º22'23.72"E 40º04'48.75"N 49º22'39.36"E 40º03'29.91"N
	Salsola Nodulosa/ Salsola Dendroides	49º22'11.23"E 40º04'28.90"N 49º22'18.64"E 40º05'12.97"N
	Suaeda dendroides	49º22'30.23"E 40º06'11.59"N 49º23'19.01"E 40º04'36.56"N 49º21'44.05"E 40º04'32.81"N
	Alhagi pseudoalhagi	49º22'53.63"E 40º05'19.66"N 49º22'34.05"E 40º05'03.07"N
	Tamarix	49º23'18.72"E 40º05'2.51"N 49º23'57.4"E 40º03'30.91"N 49º22'27.54"E 40º03'30.99"N

Field Survey 2, September 2010

This Field Survey was conducted in order to collect qualitative and quantitative data and information on actual rare vegetation classes to be use for supervised classification analyses.
Test sites were selected and evaluated both by remote sensing techniques and field investigations.

GPS Leica was tested at 20 points. GPS measurements were done at selected points of geographical coordinates in system WGS84 (Figure 5). As the result of this field season, we sufficiently enlarged our data and information on the rare vegetation distribution in Gobustan. Sampling was conducted in the

Sensitive Area of Gobustan National Park, where we registered new localities of the vegetation. The latitude and longitudes were recorded for each plot using GPS.

Figure 5. GPS Measurements, Gobustan

Table 1. Field Survey 2. Sample Plot Proformas

Habitat Type	**The name of vegetation communities**	**Sample plot GPS coordinates**
DESERT/SEMI-DESERT	Salsola Nodulosa/ Artemisia Lerchiana	49º23'57.09"E 40º03'47.29"N 49º21'53.63"E 40º03'35.90"N
	Salsola Nodulosa/ Salsola Dendroides	49º21'11.23"E 40º03'28.90"N
	Suaeda dendroides	49º22'26.85"E 40º04'16.21"N 49º23'04.96"E 40º05'22.23"N
	Alhagi pseudoalhagi	49º22'21.65"E 40º03'22.74"N 49º20'59.18"E 40º04'13.54"N
	Tamarix	49º21'20.22"E 40º04'42.43"N 49º22'17.74"E 40º05'45.74"N

Each test set corresponds to a certain vegetation type on ground.
This information serves as 'testing' data during the supervised classification (Figure 6).

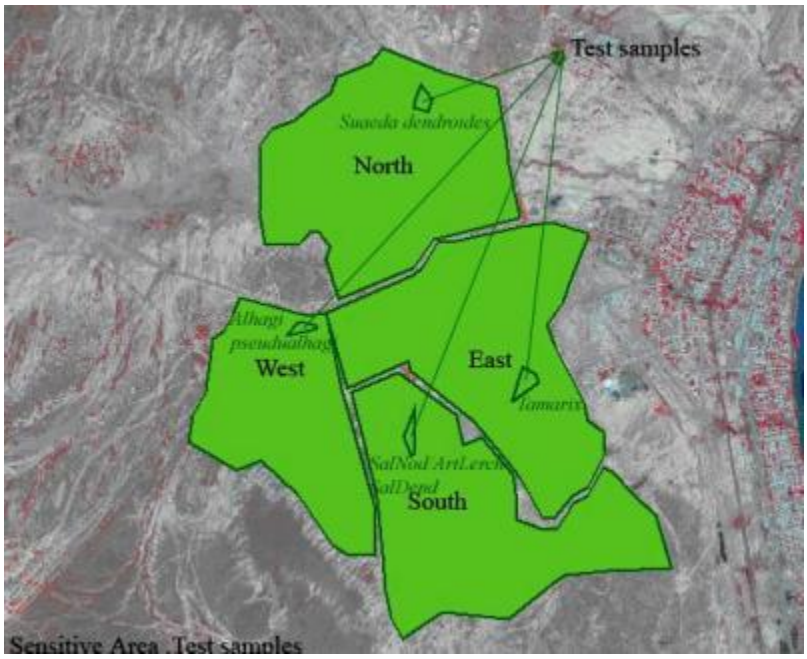


Figure 6. Test samples. Sensitive Area, Gobustan

Field Survey 3, November 2010

On-field changes detection: Redefinition/Clarification of rare vegetation communities' sites

Field Survey 3 was conducted to:

- Identification of the floristic and structure of the rare vegetation type
- Information about vegetation for the vegetation termination period
- Provide confirmation of rare plants recorded in vegetation samples (releves)
- Soil types identification


Salsola Nodulosa


Tamarix. Termination of vegetation period

Solochak, Soil type

Suaeda Denroides. Termination of vegetation period

Figure 7. Field Survey, Gobustan, November 2010. Photos by Yelena Gambarova

December 2010

Education and Public awareness activities

Enlightenment work in school of Baku was conduct. Team members organized educational lesson on the "Rare and endangered species and their protection against disappearance" for schoolchildren in Baku school №132 (Figure 8). Supporting materials banners and leaflets were used during the lesson. 30 participants attended the training: schoolchildren, teachers and director of the school. Pictures, maps, GPS equipment and slides were used to have a better illustration of the field work.

By using interactive methods during the training, participants were informed about the threat of disappearance of rare and endangered species and importance of their conservation. Moreover, participants shared with their knowledge and experiences and one of them, Mr Mamadov, the director of the school, said that it is also necessary to conduct such trainings for schoolchildren to bring up on them love and a serious attitude towards environment as a whole.

Figure 8. Educational lesson on the "Rare and endangered species and their protection against disappearance" for schoolchildren, Baku school №132

Media Appearance

www.azernews.az/.../27518-Rare_vegetation_monitoring_in_Azeri_national_ park -


azernews.az

Home | Nation | Business | Oil & Gas | Arts & Culture | Sports | Region | Analysis & Opinion

LATEST NEWS: Azerbaijan

World Media in Print

KİVDF

MOST READ NEWS

avtomobil.az

Test-drive Tüniq

04.12.2010 11:05:54

Rare vegetation monitoring in Azeri national park

BAKU – A team of scientists from the Institute of Botany of Azerbaijan and Azerbaijan National Academy of Sciences and specialists in Geographic Information Systems and Remote Sensing are undertaking an initiative on monitoring rare vegetation in the Gobustan National Park in southern Azerbaijan.

With funding from Rufford Small Grant Foundation, the Azerbaijani scientists will continue the project on spatial monitoring of rare vegetation spread in the Gobustan National Park.

Previously, the project team was awarded the Planet Action grant which provided SPOT satellite images and GIS software.

The goal of the project is to identify and evaluate the extent of the Rare Vegetation Communities found within the Gobustan National Park using SPOT images.

The scholars aim to establish and approve methodology on the monitoring of spatial distribution of the communities using geo-spatial technologies and geo-spatial data, to assess evidence of negative trends in the disappearance of rare vegetation and amend the current situation. The project also seeks to build the capacity of relevant organizations and institutions for quantitative evaluation of Rare Vegetation spatial distribution.

As well, some information about the Project has been shared through Internet: for example, some Comments about this Project were post by Yukie HORI - Coordinator of United Nations Convention to **Combat Desertification (UNCCD)** on website:
http://www.unccd.int/publicinfo/partners/menu.php
http://www.unccd.int/publicinfo/partners/stories.php?newch=gobustan

What is remaining?

- **Data Processing and Analysis**

- Classification of rare vegetation with international classification standard by using satellite images to understand the dynamics of the ecosystem;
- Statistical analysis. Result and interpretation;
- Change detection using Normalized Difference Vegetation Index;
- Rare vegetation degradation from 2004 to 2007 years in the Gobustan State National Park.

- **Impacts of rare vegetation distribution**

Threats facing to rare vegetation in the Gobustan State National Park

- **Result Dissemination**

- Education and Public awareness activities
- Involvement of students in environmental activities
- Media Appearance

- **Preparation and submission of final report**
- **Way forward**