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Rangeland Assessment in Wakhan, 2008

By

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INTRODUCTION

The rangeland analysis of the Wakhan in 2008 was designed to improve the supervised classification, supplement transect information on plant communities, supplement biomass information for estimating forage production of different plant communities, measure pH and electrical conductivity of major plant communities, improve plant species information, establish additional monitoring plots, and develop additional information on rangeland degradation. During the previous two summers the rangeland survey team worked in several of the major Pamir valleys and the team was concerned that the work in the major valleys may be in areas with greater livestock use and degradation. As such, the rangeland team specifically went into some of the smaller side valleys in the Pamir to observe conditions. The rangeland team concentrated on a rapid rangeland assessment and mapping of broad rangeland types through these areas and continued to establish permanent transects for monitoring vegetation change. A total of 28 plots were established in July/August 2008. On these plots photo points were established and physiographic measurements, plant cover, standing crop and soils samples were collected for determining salinity levels and soil pH. Soil samples were collected from the surface and subsurface at randomly located points in the rangeland plots. A total of 65 soil samples were placed in paper bags, air dried and transported back to Kabul for analyses. For 20 of these sites, a more detailed analysis of rangeland condition was determined.

In this report the general findings of the 2008 field season are described, but the major findings of the rangeland study will be presented in a final report for the rangeland assessment of the Wakhan Corridor, including work from 2006-2008. As stated in previous reports, a rapid reconnaissance methodology was used to observe as much of the area as possible to help ensure that most the rangeland types have been documented. It is believed that it is important to observe most of the area to evaluate areas important for pastoralists and areas where there may be competition for forage between livestock and wild ungulates. These rangelands are the basic resource for the livestock and wildlife that have used the Wakhan Corridor for centuries. There is no doubt that livestock grazing has impacted these rangelands and in many areas overuse by livestock has decreased site productivity. Other human use has also impacted rangelands by removing shrubs for fuel (in some areas minor use of trees was observed), cutting of hay, use of "peat" from *Carex* meadows, irrigation ditches, and (in a few areas) ditches for draining or diverting wetlands.

This report is separated into four major sections. Initially, a brief discussion of training of the rangeland assessment team is provided. Second, there is a general overview of the areas traveled and some notes on general observations. Third, is an overview of plots measured mainly to supplement plant community information for the Wakhan rangeland community analysis. As stated previously, some of the plot information was collected to determine if some smaller and somewhat more isolated valleys were in similar grazed conditions as the major valleys. This was done because most plant community information had been collected in the larger valleys in 2006-

07. The supplemental plant community information was also collected to improve the supervised plant community classification developed in 2008. A fourth section describes some rangeland degradation processes, mostly with photo descriptions, on some important rangeland community types.

RANGELAND FIELD TRAINING

Rangeland training consisted of training two Wakhi from local villages to measure rangeland site characteristics. The rangeland assessment team also consisted of a Wakhi from Pakistan (Ph.D. student studying plant chemistry) to help with Wakhi guides and Wakhi field technicians. By 15 July we were in the Wakhan and worked on rangeland analyses for 23 days. The major training consisted of development of skills with a compass (determination of aspect, slope and direction), in the use of a global positioning system (GPS) to locate sites (elevation and geographic coordinates and to be able to return to the sites), establishment of transects (including photo methods), plant identification skills, determination of above-ground biomass and discussion of rangeland degradation attributes. One Kabul student, worked as a rangeland technician from March to July, and helped with summarizing data from 2007 and participated in field work in Bamian Province in May and June. Skills learned by the student included work in spreadsheets, word documents, and report preparation. Although this technician did not join the Wakhan expedition with the rangeland team, he helped with logistics and preparing equipment. This student received a job with the Ministry of Agriculture in mid July and it is hoped that his training better prepared him for a career with the Ministry of Agriculture.

GENERAL DESCRIPTION OF ROUTES AND RECONNAISSANCE

The travel routes and transect site location of the rangeland team are shown in figure 1. The rangeland team completed a rangeland reconnaissance along the main road in the upper Wakhan from Goz Khun to Sarhad-e Broghil. In this work, major plant communities were identified by mapping these plant communities on Landsat map sheets. This information was then added to the rangeland GIS and also used in the supervised plant community classification. Some rapid reconnaissance plots were also done in the lower Wakhan, from Qila-e Panja to Khandud, along the main road.

The major fieldwork was associated with plant community transects and the measurement of standing crop (above-ground plant biomass) in several mountain valley areas leading into the Big and Little Pamir. In the following paragraphs the rangeland team's route is described by using streams to describe the general route. Information on general field notes are part of the rangeland GIS. General field notes often include an associated photo within the rangeland GIS (Fig. 2). For example, the rangeland team recorded locations of pictographs (Appendix 1), photographed the pictographs, and placed the information in the rangeland GIS.

The rangeland team initiated the major field survey in 2008 beginning at Sarhad-e Broghil and traveling to

Bozai Gumbaz using pack animals. This is a major trail, referred to as the "Kashch Goz High Route[1]." The trail begins east along the mountain ridges above the Wakhan River to Borak. At Borak the trail is to the north above the stream Darya-e Badjgaj and then over a pass into the Darya-e Shpodigis stream valley. Near the upper valley the trail turns mostly east until it crosses over the 4890 m pass at Kotal-e-Shpodgis (Uween e Sar). After the pass the trail is along the upper Darya-e Warm and is mostly a southeast trail until the trail turns to the east toward the 4600m pass (Kotal-e-Aqbelis). After the pass the trail is mostly again a southeast route along a stream (Aqbelis). Transects for plant community work were established in the Kasch Goz area and up some of the valleys off of the main trail close to the border with Tajikistan (Qirtshin Aq Djelgha and ZorAq Djelgha.) as well as in the Bozai Gumbaz area (in figure 1 transect locations are shown).

The rangeland team returned along about the same route until crossing to the "Kotal-e-Shaur Route." However, the range team leader inspected several smaller valleys in upper Darya-e Warm and upper reaches of Darya-e Shpodgis to rock/ice level and almost to the Tajikistan border to determine if these smaller valleys were being grazed by livestock as intensively as the main valley. In general, all valleys inspected in this area were heavily used by livestock. The valley of Darya-e Warm is one of the most overgrazed valleys, and it has not been determined why this is true. However, it is a major route into the Little Pamir.

A few kilometers west of Kotal e Aqbelis a new Wakhi camp was being constructed (Fig. 3). The rangeland team leader was told that this new camp was being established to ensure control by Wakhi rather than by Kirgiz. As this area currently receives overuse by livestock the new camp is likely not good for future rangeland conditions. Also, if what was told to the range team leader was true, it provides some evidence of conflicts associated with pasture use in the area.

The rangeland team crossed west over the pass Kotal-E Qarbel (4820 m) and into the upper Darya-e Badjgaz (Darya-e Shaur). Additional plant community descriptions were collected in the upper Shaur stream valley where rangeland conditions were better than in many of the other major valleys reconnoitered. The route proceeded south until crossing Darya-e Ptukhshur where the team then moved west along a tributary until again moving south over an unknown pass. After the pass the rangeland team traveled down the Darya-e Sarhad until reaching Sarhad-e Broghil. Field notes of these reconnaissance trips, photos and transect data have been included in a rangeland GIS and this information is not detailed in this section. During these reconnaissance trips the WCS range team established 28 transects with spatial coordinates and photos to be used as potential permanent photo points and for establishing plant community information. On these sites standing crop (kg/ha) was determined to estimate forage production and thus a general guide to grazing capacity for future analyses. A summary of the transect information will be presented and discussed in the section "Rangeland Plant Community Analyses."

[1] These routes are described by Mock and O'Neil (2005) and these routes are along major trails into the Big and Little Pamir.