

January 2015

**Report on Detailed Bird Survey and Assessment BNT 1-2-3.**  
**Study, Survey & Report on ADB CAREC Transport Corridor -1 (between Km370 to Km500)**  
**(Bishkek – Torugart Road) Projects 1-2-3.**

**A. Introduction and objective**

1. This document is the Detailed Bird Survey and Assessment for the Bishkek – Torugart Road (BNT123 Bird - compiled in October 2014). The report is prepared to document studies made in 2014 in response to certain observations and allegations that bird habitats have been damaged by the project construction works.
2. Bird surveys were conducted prior to the commencement of BNT construction works in the project design phase during 2008 and the results were reported in the report entitled “*Draft Final Report Bishkek Naryn Torugart Road Project 1: Dolon Pass to Akbeit Pass Km278 to 478*”. That report was dated 25<sup>th</sup> July 2008 and the results of the bird surveys are found in *Appendix F: Project Ecosystem Study* of that report. The objective of this study was to compare the results from 2008 with the birds that are observable immediately after the project sections from Km370 to Km500 were completed in 2014.
3. Birds respond rapidly to environmental changes such as in climate, vegetation, prey and other food availability and increased disturbance from human activities. Assemblages of bird species can therefore be used as indicators of environmental parameters and of the environmental status of ecosystems.

**B. Validation of Methodology and Objective**

4. The methodology for bird surveys has been established for use by reputable ecologists and ornithologists in Kyrgyz Republic for several years. The method is simple and effective for environmental monitoring by counting numbers of birds in defined locations. The observer will patrol certain defined transects and record the numbers and species of birds at different times of year.
5. The method is designed to provide facilitation and coordination for monitoring and evaluation of ecosystems by staff with responsibilities for protected areas and reserves, as well as by field ornithologists and zoologists. The method is based on counts of the most common species of birds. The quantification of birds is used to indicate the condition of the host ecosystem and the degree of disturbance (or preservation) or destruction due to human activity. Such assessment is a necessary part of conservation management of natural biological communities, biological resources and species of conservation interest such as those listed in the IUCN Red Book: The assessment can be used to indicate the scale of impact or the degree of success of conservation measures and assists in the identification of adequate ways to reduce and prevent risks and threats leading the deterioration of the natural environment.
6. In this case however the survey has a simpler and more obvious objective. It is to indicate and assess if the bird species and communities present in 2014 are comparable with those that were present in 2008.

**C. Methodology**

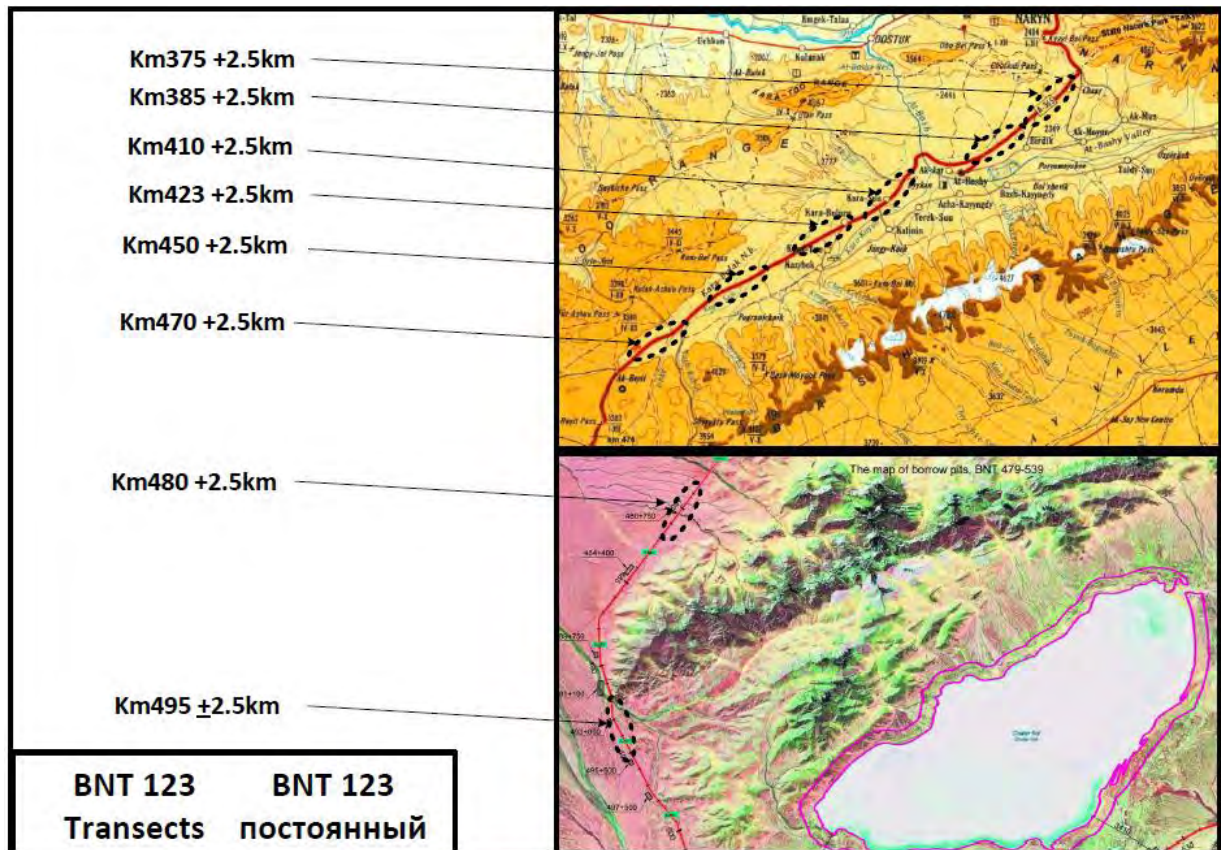
7. **Species and habitat:** The study focused on all species present but with particular emphasis on indicator bird species identified as valuable ornithological resources in BNT 1 and BNT 2 surveys in the earlier stages of the CAREC project (c2008).
8. In addition other significant ornithological features and habitats contained within the eight transects near the road alignment were recorded. Three of these transects were originally set up during the BNT 1 and BNT 2 ecological surveys in the earlier stages of the CAREC project.
9. **Surveyor:** The bird / ornithologist surveyor for the 2008 BNT surveys was re-engaged to complete the surveys for 2014. The bird / ornithologist surveyor was part of the team that developed the techniques prior to 2008<sup>1</sup>. This allows confidence in the skills of the surveyor and direct comparison of results.
10. **Timing:** The services were broadly completed in three survey stages. Timing of the survey stages was adjusted as necessary but three temporally distinct surveys were completed in late spring, summer and autumn 2014. The timing was designed to take account of seasonal changes in species composition in breeding populations at each site: i.e. May-June - the breeding period, hatching; July – post-breeding & migrations; August-September – inter-territorial migrations, preparation for the autumn migration.

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<sup>1</sup> Birds - indicators of a condition of ecosystems of Central and Internal Tien-Shan / a methodical guideline by Shukurov E.D., Shukurov E.E., Zhusupbaeva A.A. 2007.

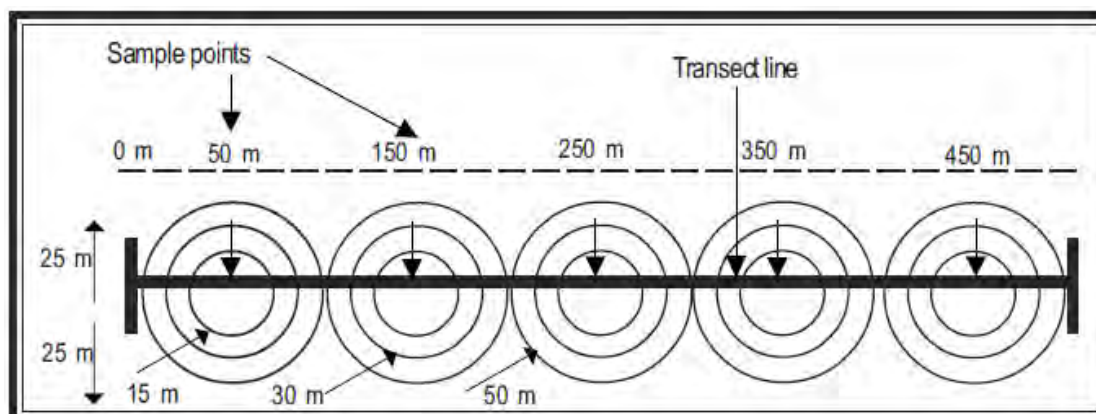
11. **Location:** Eight transects were set up including three used previously in the 2008 surveys (Km410, Km423, & Km470 approx.). Two transects are on BNT2 Part 1, two transects are on BNT1 two transects are on BNT2 Part 2 and two transects are on BNT3. For purposes of this survey each transect was 5km long and the transects were targeted at the locations shown in Figure 1 by walking  $\pm 2.5$ km from the centre of location indicated. The method applied similarly to all transects therefore allowed qualitative identification of bird fauna in the areas compared to the previous surveys and inter-transect variation (see Figure 1 below for approximate locations).

**Figure 1: Approximate Location of Bird Transects**



12. The transects were recorded by reference to the blue and white kilometer marker poles next to the road and the GPS location record of the start middle and end of each transect. The locations were recorded on the survey sheets by locating the start kilometer pole nearest the position of the transect and a view is shown in the photographs.

**Figure 2: Sampling Points along Permanent Transects.**



13. The transect lines were patrolled during the three seasons as planned and bird species recorded at intervals in sequence for species presence and numbers of individuals of the species by observation. Photographs were made along the length of the transect so that the habitats and general location with respect to surrounding mountains, could be clearly seen. Sample photographs are shown in Figure 3.

**D. Results – Broad comparisons of environmental conditions 2008 and 2014.**

14. The general environmental conditions and habitats around the transect locations are most easily depicted by photoreconnaissance. The eight habitats have been compared based on the overall conditions in 2014 (Figures 3a & 3b) compared to 2008 (Figure 3c). In the operational phase the physical disturbance of the surrounding habitats is confined to within about 5m either side of the centerline. Birds and other animals can frequently be seen within a few meters of the disturbed areas. There is no long term physical disturbance of the habitats outside the road corridor. The impacts have been short term and appear to be largely reversible except along the actual road pavement and adjacent drains.

**Figure 3a: Photographs of Transects 1-4.**

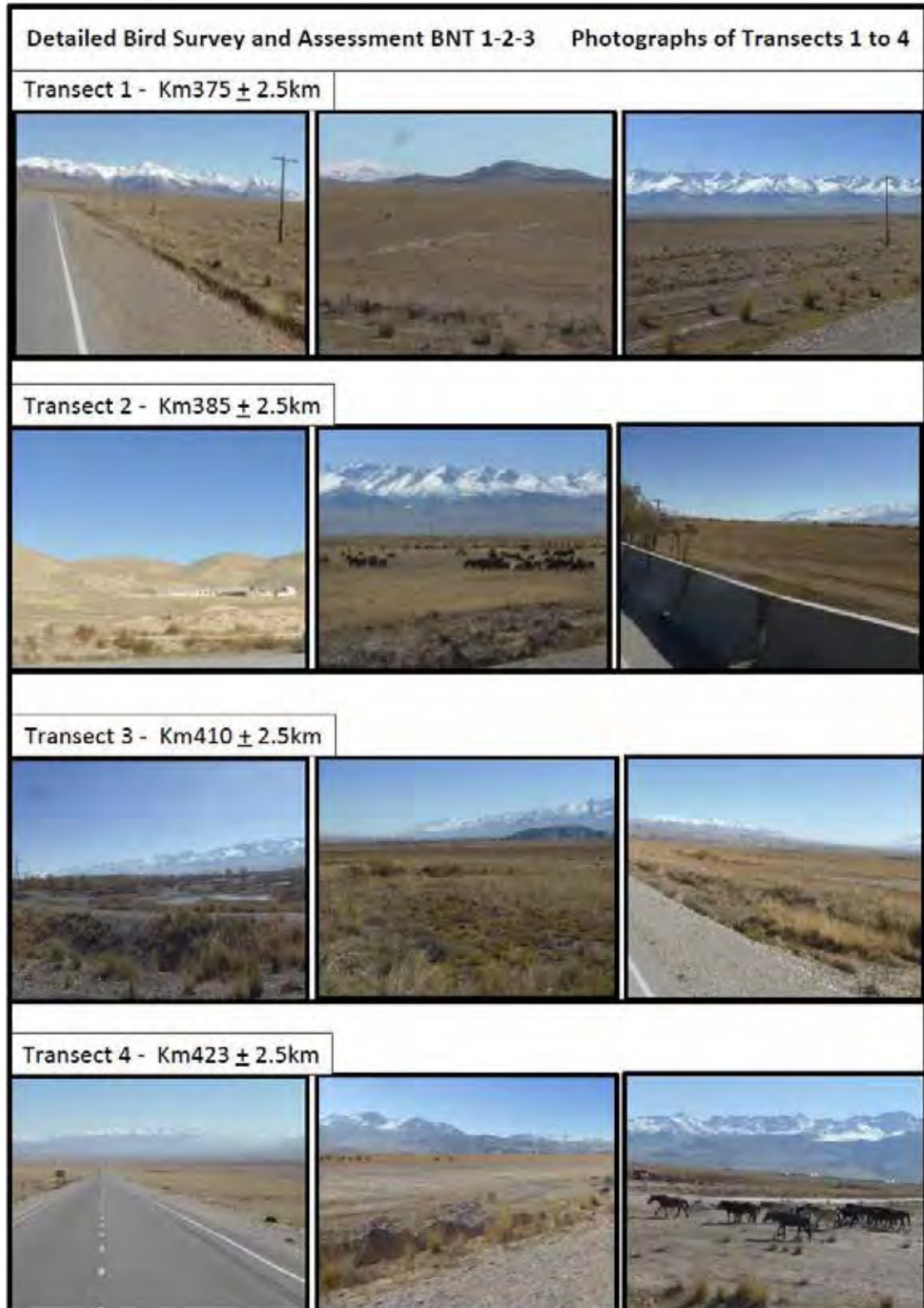


Figure 3b: Photographs of Transects 5-8

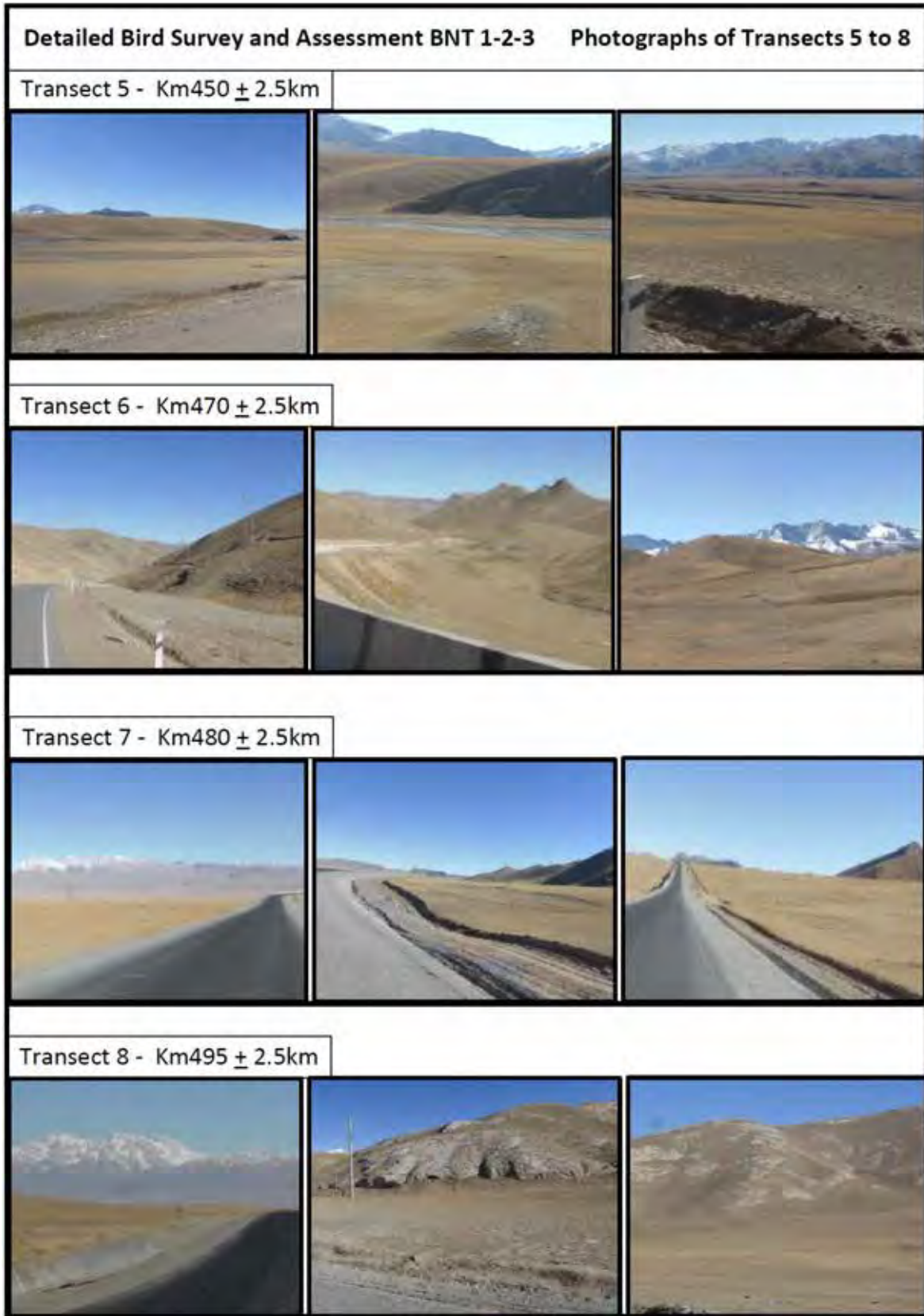
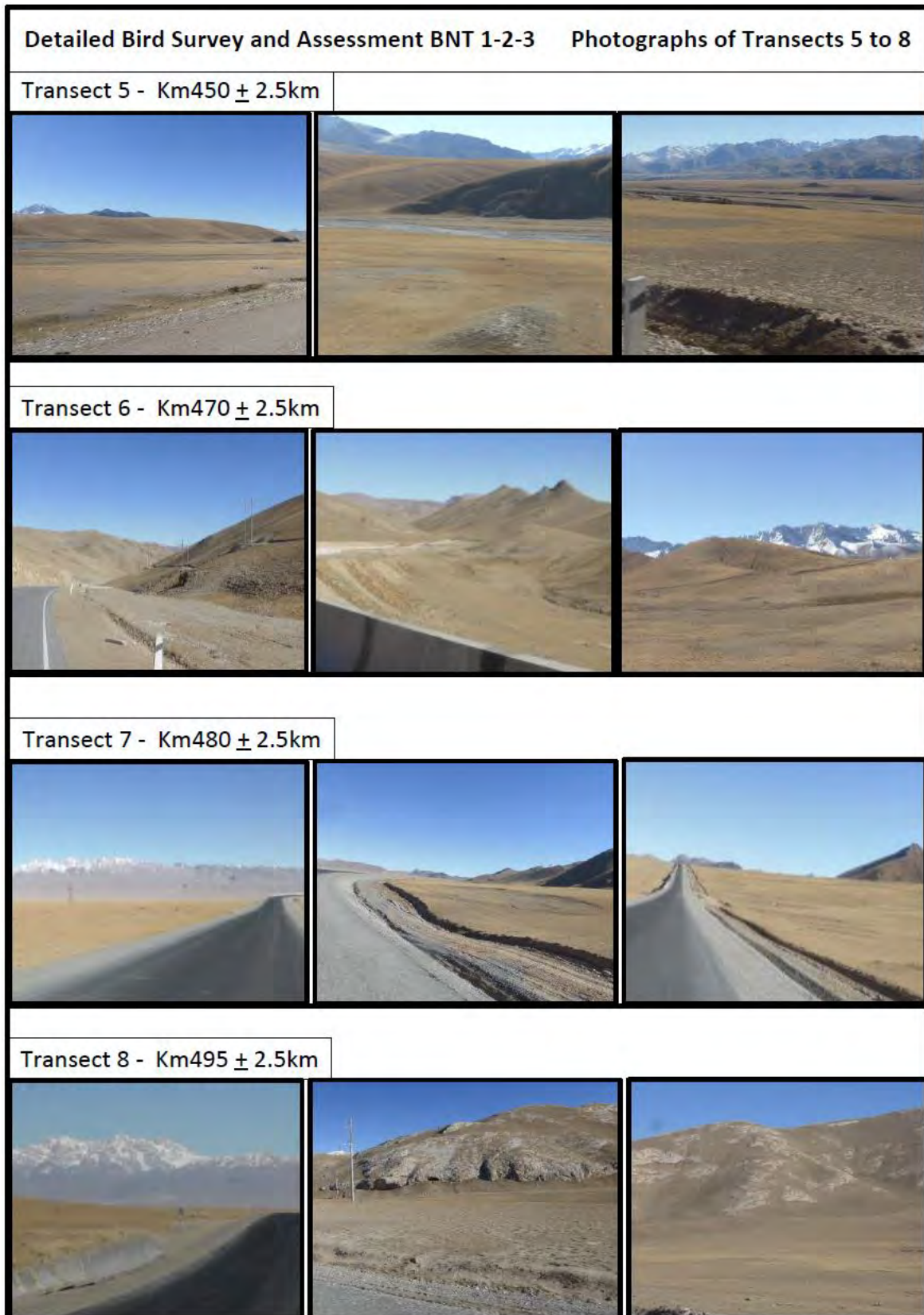
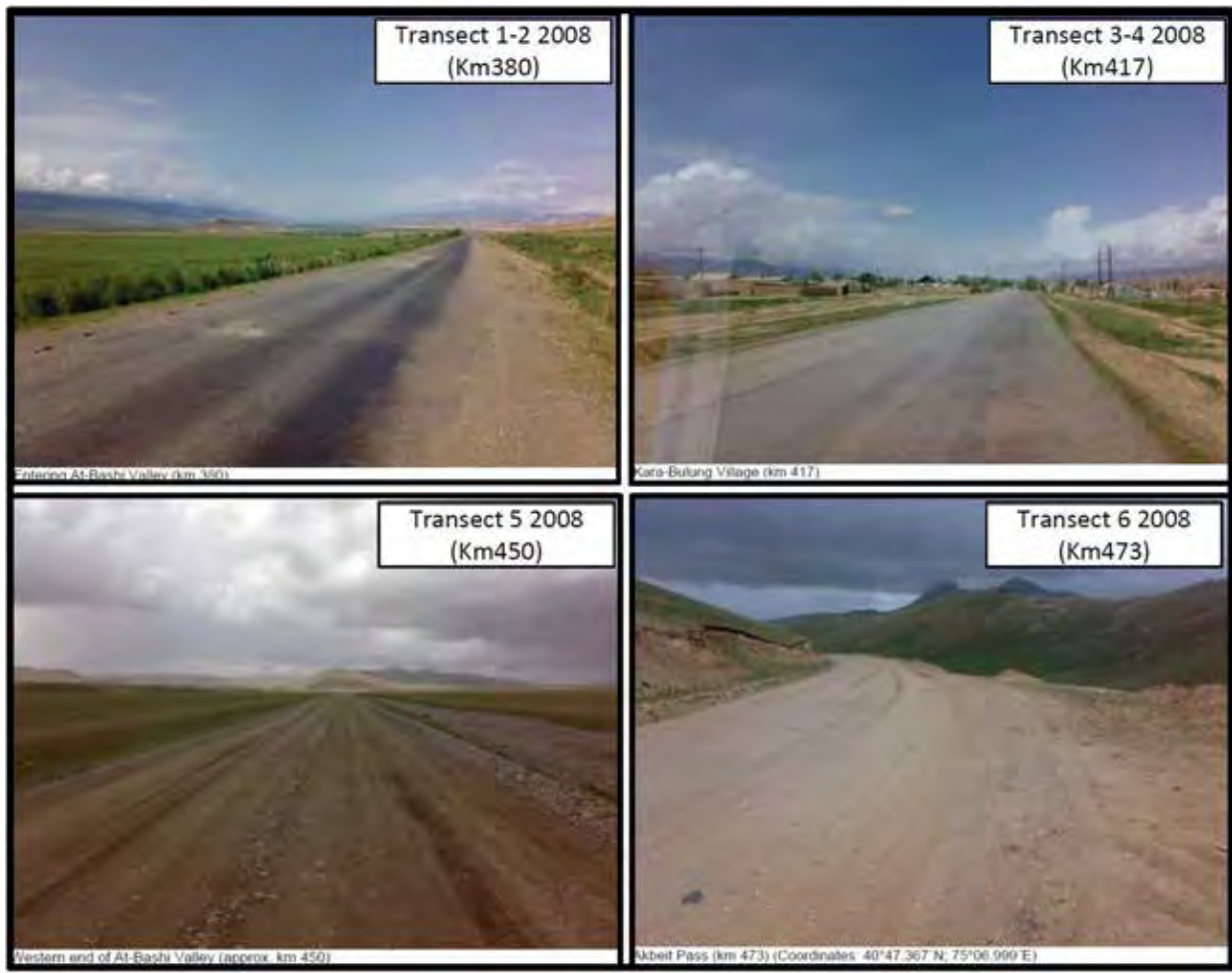


Figure 3c: Photographs of Transects 1-6 in 2008.





**E. Results – Detailed assessment of bird species.**

15. The comparisons of bird species present are summarized in Table 1. The Shukurov index is on average slightly higher for 2014 than for 2008 in the three transects that can be compared. The index for the other five transects shows many indicator species are present in all areas and the ecosystem condition can be considered as relatively undisturbed. The slightly lower index at Transect 4 is near the inhabited and disturbed areas around the towns of Kara Belung and Kara Sur. The index result for Transect 4 is the lowest for both 2008 and 2014. The species present are those that tolerate the disturbance caused by human communities where the ecosystem condition is highly modified by human activity. A lower index would be expected in any case in this area, with some species present in limited numbers; indicative of the habitat that is disturbed by the settlements at Kara Belung and Kara Sur.

16. The summary is presented in Table 1 for each of the each transect (see also appendix A for all species encountered).

**Table 1: Comparison of Shukurov bird index for 2008 and 2014 Transects 4/5/6.**

Transect 2014	Km	Species 2014	Index 2014	Average 2014	Average 2008	Index 2008	DFR BNT: Dolon Pass to Akbeit Pass
1	375	21	2.4				
2	385	32	2.2				
3	410	24	2.3				
4	423	23	1.7	2.1	1.8	1.8	Kara Bulung Km 417
5	450	10	2.0			2.0	At-Bashy Valley Km422 – 425
6	470	10	2.5			1.7	Akbeit Pass Km470 – 473
7	480	7	2.7				
8	495	5	2.5				

**Note:** maximum score 3 provides fully intact natural ecosystems. Minimum - 1 given ecosystem collapse. Points are displayed by the number of indicator species and their abundance. In general ecosystems can be assessed as "satisfactory".

***F. Conclusion.***

17. Birds and other animals can frequently be seen within a few meters of the BNT123 road. There is no long term physical disturbance of the habitats outside the road corridor. The impacts from road construction have been moderate and reversible. The general environmental conditions elsewhere seem to support a reasonable number of indicator species and the ecosystems remain relatively undisturbed. The slightly higher index values indicate the bird species and communities present in the nearby ecosystems in 2014 are comparable or slightly improved compared to those that were present in 2008 and the condition is generally acceptable. The areas around the towns of Kara Belung and Kara Sur are more disturbed due to human activities.

## Appendix A Brief description of the subject area

18. The highway Bishkek – Naryn – Torugart passes through Northern and Internal Tien Shan. More than 2/3 of the route is in the area of the Internal Tien Shan.

19. Internal Tien Shan is highland – extensively a closed area, sharply raised to heights of 2000-3000 masl, with sharply continental climate, a big variety of a soil and vegetable cover, with obvious prevalence of steppe and meadow vegetation. A peculiar altitudinal zonality is expressed in their placement (Chupakhin, 1959). The general characteristics of climate is the hot summer, and winter; which is severe for such low latitudes. There is abundance of solar radiation, dryness of air and a small amount of rainfall.

20. Internal Tien Shan is characterized by very complex orography. Numerous ridges are focused in the most various directions and in most cases separated by hollows of a tectonic origin. Despite the general complexity of structure of surface, the main distinctive orographic feature is the alternation of high thrusting mountain ridges, mainly of Paleozoic age, and the large intermountain hollows filled with meso-Cainozoic deposits up to altitudes of 3000-4500 masl.

21. The complex orographic structure of the territory causes a variety of climatic conditions: from hot climate of semi-deserts to a frigid climate of mountain deserts. Deep intermountain valleys are subject in the winter of temperature inversion.

22. The climate is subject to a number of factors. Ridges have absolute height over 4000 m above sea level and air masses (mainly from the west and northwest side) lose practically all moisture on outer side of ridges. Thus, the adverse high altitude conditions are compounded by increased aridity of climate.

23. The height differences, rainfall, drainage cause formation of high-rise landscape belts (zones) ranging from flat foothill desert steppe (semi-desert), foothill mid-mountain steppe, mid-mountain forest - meadow and steppe, mountainous meadow and steppe, mountainous syrt & nival.

24. The highway Bishkek – Torugart crosses two physiographic regions of Internal Tien Shan: (i) At-Bashi-Karakoyun and (ii) Arpa.

25. The At-Bashi area from the north has the general with Middle Naryn boundary ridges: Dzhaman-Too, Baybiche-Too, Kara-Too, Alamyshik and Naryn-Too, from South side borders it the ridge of At-Bashi.

26. The At-Bashi hollow stretches from the northeast for the southwest on 120 km. The central part it is limited to isohypses in 2000-2400 m with a width up to 20 km. At the mouth of the river of Karasuu the absolute height of a bottom of a depression increases to 3000 m, and its width decreases to 2 km. The annual quantity of an atmospheric precipitation in a middle part of a hollow fluctuates from 300 to 400mm, the spring and summer maximum is accurately expressed here. In general, the climate of At-Bashi District is similar to climate of the Middle Naryn area, but to the features.

27. The prolonged winter and low-snow that allows to use valleys of the rivers of At-Bashi and Kara-Koyun as winter pastures. Transition to spring sharper, than in the Middle Naryn area. Summer warm, with an intermittent rain, with a big difference of daytime and night time temperatures. Fall is short and dry.

28. The Arpa hollow is extended in the northwest direction on distance about 50 km within absolute heights of 3100 - 2750 m above sea level. Climate is rather dry with the annual sum of rainfall up to 400 mm. The prevailing winds northeast and northwest.



**Table A1 - Distribution of high-altitude zones within the Inner Tien Shan**

Name of the zone	The relief and altitudes ( <i>m</i> )			
	Plains of intermountain basins	The northern slopes of the ridges surrounding the basin or valley	The southern slopes of the ridges surrounding the basin or valley	plains and ridge syrts
Semidesert	from 800 to 1900-2000	from 1000-1100 to 2000-2100	from 1100-1200 to 2100-2300	-
Dry and forb-grass steppes of middle mountain	from 1500 to 1900-2000	from 1800-1900 to 2500-2600	from 1900-2000 to 2800-2900	-
Forb meadows and pine forests	-	from 2300-2400 to 3100-3200	-	-
Subalpine shrubs, meadows, meadow-steppes and steppes	-	from 2400-2500 to 3300-3400	from 2500-2600 to 3400-3500	-
Alpine meadows	-	from 3000-3200 to 3600-3700	-	On the northern slopes of the ridges from 3300 to 3700-3800
Highmountain meadow-steppes and the steppes	-	-	from 3100-3200 to 3700-3800	Along the southern slopes of ridges and valleys from 3200-3400 to 3700-3800
High altitude cold desert	-	-	-	from 3200 to 3800-4000
Nival	-	Above 3600-3700	above 3700-3800	Above 3800-4000













<b>FAMILY FRINGILLIDAE FINCHES</b>																									
<b>SUBFAMILY CARDUELINAE</b>																									
Genus <i>Carduelis</i>																									
49. Eastern Goldfinch	<i>Carduelis caniceps</i>					X																			
50. Common Linnet	<i>Carduelis cannabina</i>										X														
Genus <i>Carpodacus</i>																									
51. Common Rosefinch	<i>Carpodacus erythrurus</i>	X			X	X	X	X	X																
<b>FAMILY EMBERIZIDAE BUNTINGS</b>																									
<b>SUBFAMILY EMBERIZINAE</b>																									
Genus <i>Emberiza</i>																									
52. Corn Bunting	<i>Emberiza calandra</i>				X		X	X	X	X															
53. Grey-necked Bunting	<i>Emberiza buchanani</i>	X	X	X	X		X	X	X		X	X	X		X		X	X				X			
54. Red-headed Bunting	<i>Emberiza brunniceps</i>				X		X	X																	
<b>Total Species recorded</b>		14	10	9	28	17	3	19	19	13	14	14	15	8	5	4	5	8	5	4	6	1	5	3	2
<b>Total Species recorded in 2014</b>				<b>21</b>			<b>32</b>			<b>24</b>			<b>23</b>			<b>10</b>			<b>10</b>			<b>7</b>		<b>5</b>	