Consulting Services for Post-Construction Avian & Bat Monitoring for the Wind Park Bogdanci (BMZ NO. 2009 66 390)

2nd PROGRESS REPORT

20th June, 2018

geonatura

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PROJECT	CONSULTANCY SERVICES FOR POST-CONSTRUCTION AVIAN & BAT MONITORING FOR THE WIND PARK BOGDANCI (BMZ NO. 2009 66 390)
DOCUMENT	**2nd PROGRESS REPORT**
DATE	20th June, 2018
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1 Introduction

According to the Contract "CONSULTANCY SERVICES FOR POST-CONSTRUCTION AVIAN & BAT MONITORING FOR THE WIND PARK BOGDANCI (BMZ NO. 2009 66 390)", Progress Reports are to be submitted every 4 months and contain information about program progress. They shall summarize main activities, the progress achieved during the reporting period, main problems encountered and the envisaged solutions to overcome the problems, the financial status of the programme etc.

This Progress Reports represents the period from 21st February 2018 until 1st June 2018.

2 Period of the fieldwork investigation: February – June 2018

As planned by the Contract, bat and bird research teams conducted their fieldworks every month. In May, team for habitat survey conducted field visit in order to validate preliminary habitat map. The timing of all activities which were carried out during the Project is presented in the Table 1. Until June 2018, advance payment (20 %) and first invoice payment (14 %) has been made.

Table 1 Activities in period of investigation from October 2017 to June 2018

Date	Activity
12.-17.12.2017	*Preliminary fieldwork with ultrasound detector installation at wind turbines and Inception meeting*
14.-19.01.2018	*Bats fieldwork*
12-.16.02.2018	*Birds fieldwork*
06.-09.03.2018	*Bats and birds fieldwork*
25.-29.03.2018	*Birds fieldwork*
10.-13.04.2018	*Bats and birds fieldwork*
23.-27.04.2018	*Birds fieldwork*
14.-18.05.2018	*Birds fieldwork*
21.-25.05.2018	*Bats and birds fieldwork*
28.05.-01.06.2018	*Birds and habitat fieldwork*

3 Time schedule – work done

In this, second period of the Project, intensive fieldwork has been made. The exact date of each fieldwork, for each team, is presented in Table 1. Also, every fieldwork was pre-announced to the Employer. The activities, which have been accomplished from the beginning of the Project, are listed in Table 2.

Table 2 *Conducted project activities in period from October 2017 to June 2018*

| ACTIVITIES	2017			2018					
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1. PREPARATORY ACTIVITES									
Review of the existing Project area maps, documentation, literature and existing data on bird and bat fauna, habitats and vegetation in the surrounding area	▓								
Development of a post-construction monitoring programme	▓								
Designing and setting up digital database	▓								
Preparation of ultrasound detectors, microphones and power supply (bat survey)	▓								
Preparation of preliminary habitat maps								▓	
2. COLLECTION OF FIELDWORK DATA									
Preliminary fieldwork			▓						
Bats — Setting up / adjusting ultrasound detectors at wind turbines			▓						
Continuous bat activity monitoring at nacelle height using stationary bat detectors at optimally 7 wind turbines with monthly check-ups and collection of SDHC Memory cards			▓	▓	▓	▓	▓	▓	▓
Bat roost surveys									
Baseline study -Periodic bat detector monitoring						▓	▓		
Baseline study - Bat roost surveys				▓					
Birds — Vantage points count – constructed and planned WF						▓	▓		
Distance sampling for breeding birds - constructed and planned WF						▓	▓		
Observation sites watch for migratory birds- constructed and planned WF					▓			▓	
Area search - constructed and planned WF						▓	▓		
Habitat survey - constructed and planned WF						▓	▓		
3. PROCESSING AND ANALYSIS OF COLLECTED DATA									
Bats — Echolocation/sound analysis for continuous bat activity monitoring at nacelle height (species composition, bat activity index)			▓	▓	▓	▓	▓	▓	
GIS analysis of collected data									
Baseline study - Echolocation/sound analysis for periodic bat activity monitoring along linear transects						▓	▓		
Baseline study - GIS analysis of collected data					▓				
Birds — GIS, statistics and ecological analysis of collected data – for constructed WF Bogdanci						▓	▓		
GIS, statistics and ecological analysis of collected data – for future extension (planned WF)						▓	▓		
Validation of the preliminary habitat map (habitat mapping activities)									

4 Fieldwork methodology and other important information

Habitat survey

Preparatory work for the habitat survey included collection and analysis of the existing relevant literature on flora, vegetation and habitats of the Project area, as well as available spatial data: potential natural vegetation (PNV) and vegetation maps, topographic maps of assessed area and digital ortophoto and other available layers (e.g. Google Earth, Bing Maps etc.). Based on the aforementioned analysis and orthophoto interpretation, a preliminary habitat map of the Project area was produced, in the scale 1:25 000. During this step, different habitat classes were distinguished and delineated as polygons, reflecting the expected habitat structure and the diversity of the area. The next step was to assign an appropriate habitat type of the EUNIS habitat classification to all delineated polygons. Survey design for the fieldwork was based on the preliminary habitat map and the potential accessibility of different parts of the Project area, with a total of 40 sampling points encompassing all distinguished habitat types.

Fieldwork for the Habitat survey was conducted as planned, between May and July which is the optimum time period for the field mapping, as the vegetation in the project area is now fully developed. It was conducted by a team of botanists and habitat mappers, using GPS technology, aerial photographs and topographic maps. Due to the low accessibility of some parts of the Project area, 11 sampling points (defined during the preparatory work) were unreachable. Instead, 13 alternative points were sampled for the corresponding habitat types, as well as 29 earlier planned sampling points. In total, 42 sampling points were sampled (Figure 1), using a standardized approach (pre-prepared field forms, photo documentation etc.).

The sampling was performed in the buffer zone up to 500 m of each existing turbine, and the buffer zone up to 1000 m of each planned turbine. Based on the performed fieldwork and the collected data, the verification of the preliminary habitat map was carried out.
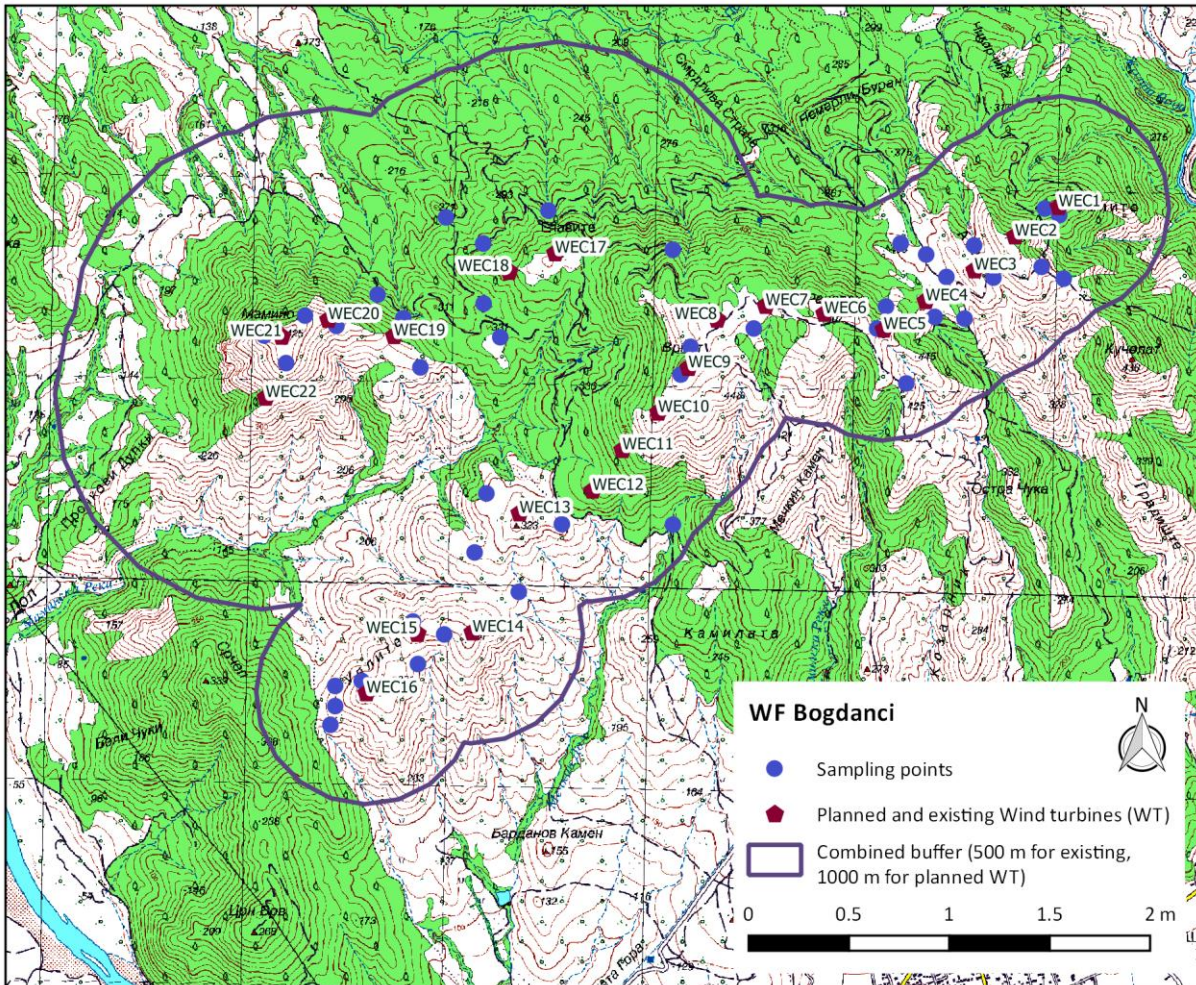
Figure 1 *Location of sampling points, where data collection was performed for the habitat survey, in the buffer area of planned and existing WF turbines*

Based on the results of the field survey and the verification of the preliminary habitat map, the final habitat map will be produced. It will serve as basis for the Space Usage Degree map development.

Bats

As planned, the ultrasound detectors were installed at seven wind turbine nacelles (W01, W04, W07, W10, W12, W14, W16) in the period from 12th to 15th December 2017 (Figure 2). In the period from March 2018 data stored on SDHC Memory cards were collected and microphones were tested on a regular basis once per month. Detailed analysis of the recorded bat echolocation signals has been conducted using sound analysis software (Sonobat, Kaleidoscope). The analysis of meteorological data will be conducted when detailed data on wind speed at nacelle height and temperature measured at the weather mast from WF Bogdanci will be available. During the regular monthly data collections from bat detectors installed at nacelles, our team has discovered a total of nine bat carcasses in the vicinity of wind turbines.

Figure 2 Picture of the microphone at the nacelle at WF Bogdanci, taken from the ground (photo: G. Rnjak)

Figure 3 Bat roost Rudnik Sv. Nedela - (photo: G: Rnjak)

Bat survey included reconnaissance and identification of potentially significant bat roosts. Important roost site Rudnik Sv. Nedela was recorded 1,8 km from WF Bogdanci and approx. 3 km from the location of the future extension, which has been regulary investigated each month. Abundance of bats was estimated visually, using photography. Species composition was determined visually and with the use of ultrasound detectors (Elekon Batlogger M). Species and reproductive status were determined by the examination of individual specimens. All bats were released unharmed where captured, immediately after determination. Ambient temperature, relative humidity and wind speed were measured inside and outside the bat roosts using pocket weather stations (Kestrel 4000 Pocket Weather Tracker). In the 1 km buffer zone of constructed and planned WF Bogdanci turbine locations, other suitable types of roosting areas were investigated (trees of suitable height, width and age). These loactions will aslo be surveyed in June/July, during dusk and dawn, using visual observation and ultrasound detectors.

For the purpose of bat activity survey, bat calls (echolocation) were recorded along the linear transect (bat detector monitoring method). This survey was carried out once per month in March and April, and twice in May. One of the aims of this method was to determine if bats were only passing through the Project area, or they are active for a longer period, mainly for foraging. Manual broad band detector (Elekon Batlogger) has been used, which is recording in real time and has automatic activation at sound frequencies between 10 and 155 kHz. Also, it automaticlly records a point of the recorded bat activity. Microclimatic parameters (temperature, air humidity, wind speed) were measured (Kestrel 4000 Pocket Weather Tracker) at the beginning and at the end of each transect. Detailed analysis of the recorded bat echolocation signals is being conducted using sound analysis software (BatExplorer). The position of the linear transect at the location of the future extension - 6 turbines is presented in Figure 4. All collected data was validated, processed in GIS and stored in the digital database.
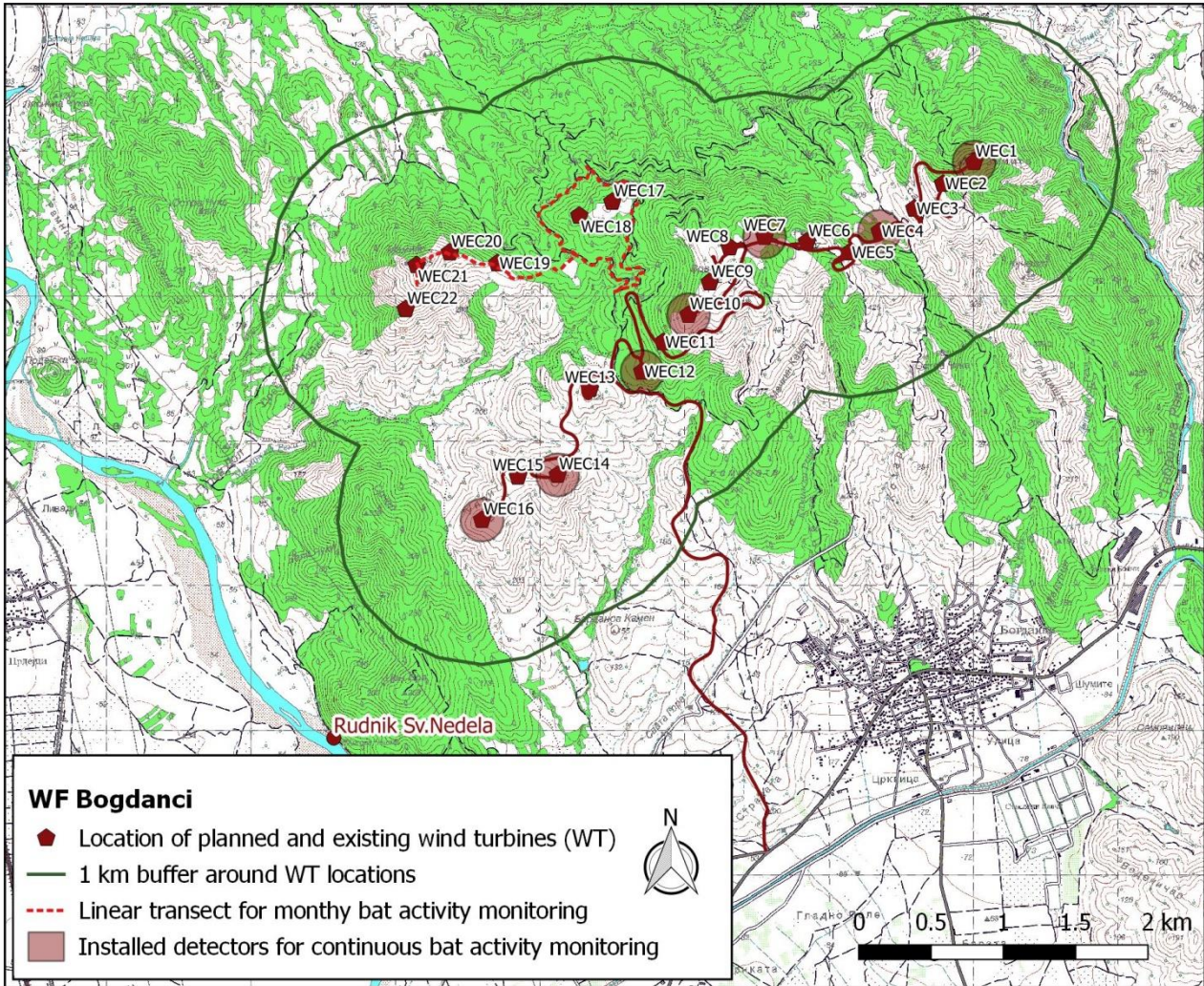
Figure 4 *Location of liner transect for monthly bat activity monitoring at planned WF extension and location of installed detectors for continuous bat activity monitoring at turbine nacelles*

Birds

From 21st February to 1st June 2018, bird team has performed 7 field visits to the Project area in order to collect valuable data about migration and nesting season. Watching bird activity from all 3 Observation sites (OS) was performed during migration period (February – April, Figure 5). Positions of these OS enabled the best view at southern (south-east, south, south-west) areas, where the migration was expected from.
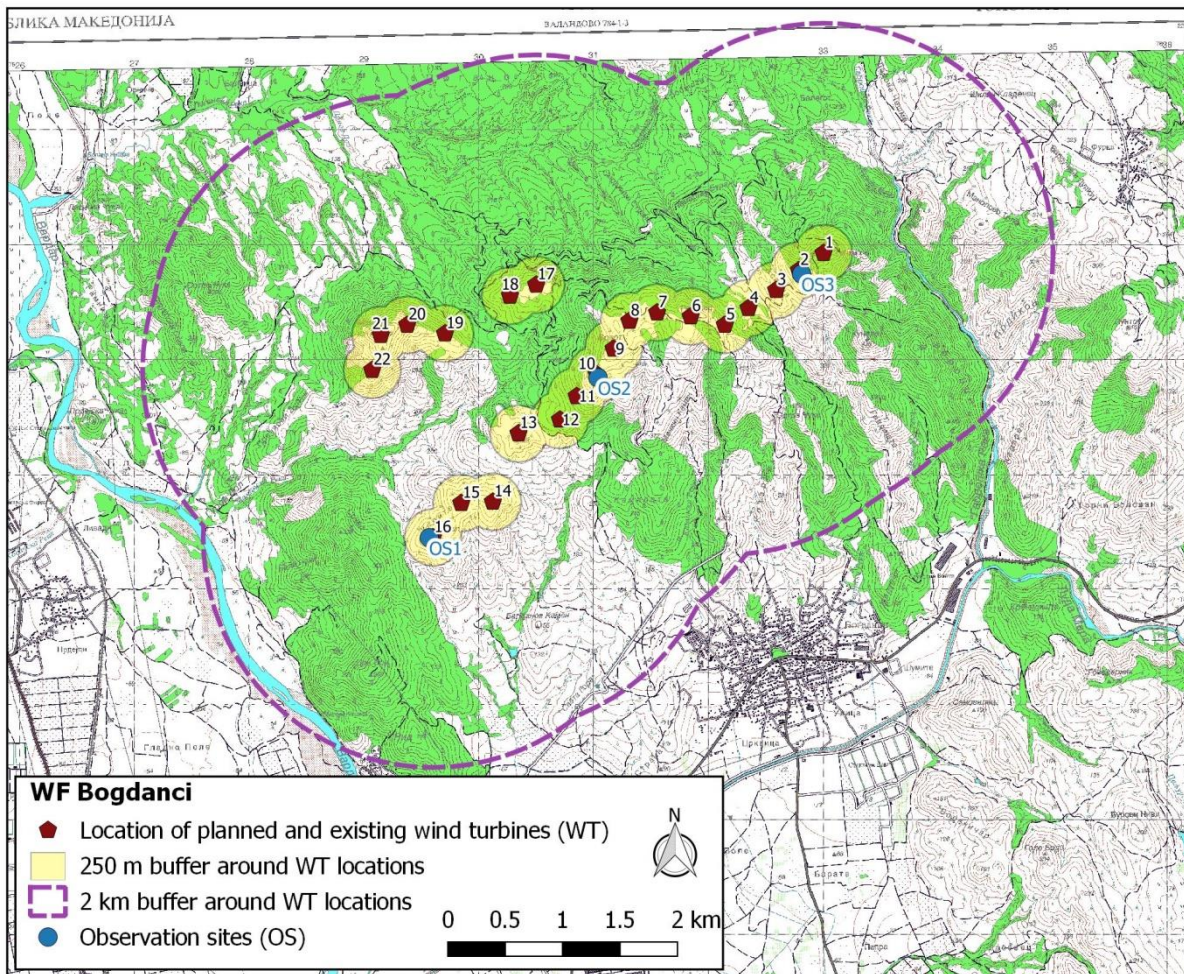
Figure 5 *Location of Observation sites (OS) at WF Bogdanci*

At the beginning of the nesting season, 5 Vantage points (VP) were defined (Figure 6) and this method was used to collect data about nesting species sensitive to windfarms (mostly Raptors and bigger birds, such as Storks), at constructed and planned Project area. This method was used from March, and will be used until end of the nesting season -June. A view from these locations covered the whole WF surrounding area.

Also, during the nesting season the Distance sampling method was used, twice a month, to collect data on breeding bird populations (mostly smaller birds, Passerines), at both Project areas (constructed and planned WF, Figure 7). Transect T1 is located partly at constructed and partly at planned WF area and is approximately 2,8 km long, and second transect, T2 is located at constructed WF area and it is approximately 1,1 km long. Distance sampling method was conducted early in the morning, during the stable weather conditions, without strong wind and precipitation.

Area search was conducted during every field visit.

All collected data was validated, processed in GIS and stored in the digital database.
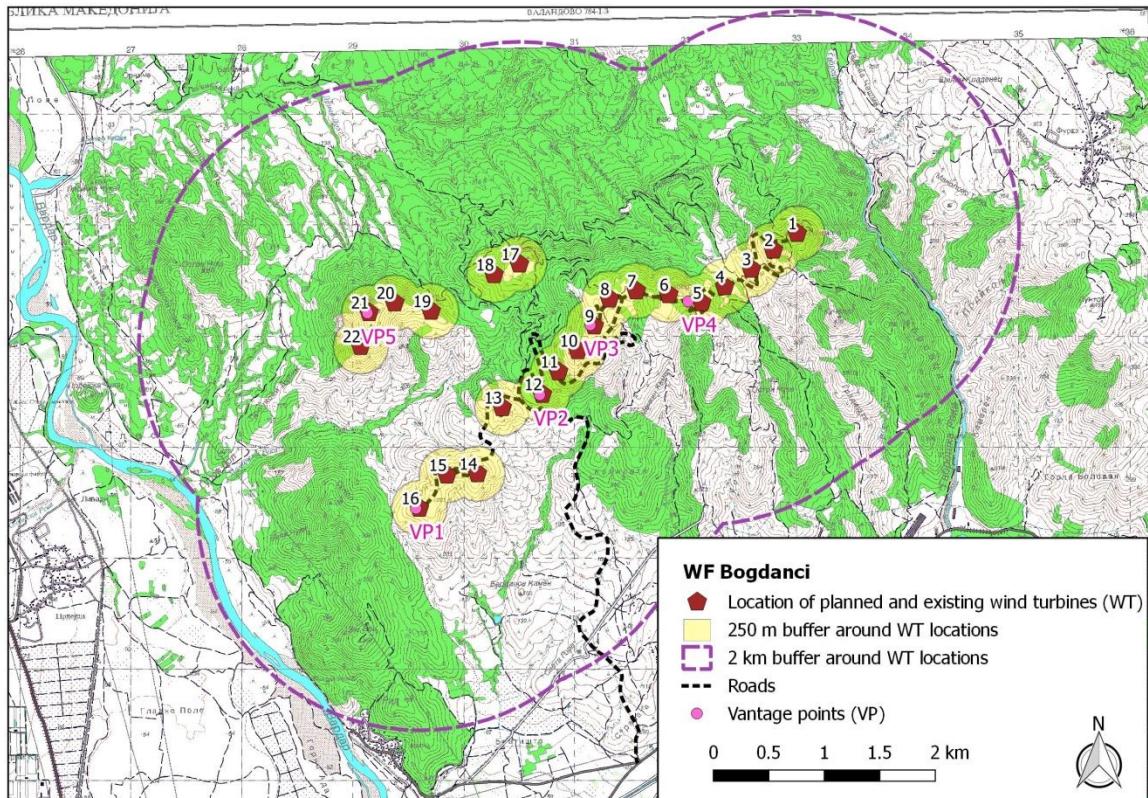
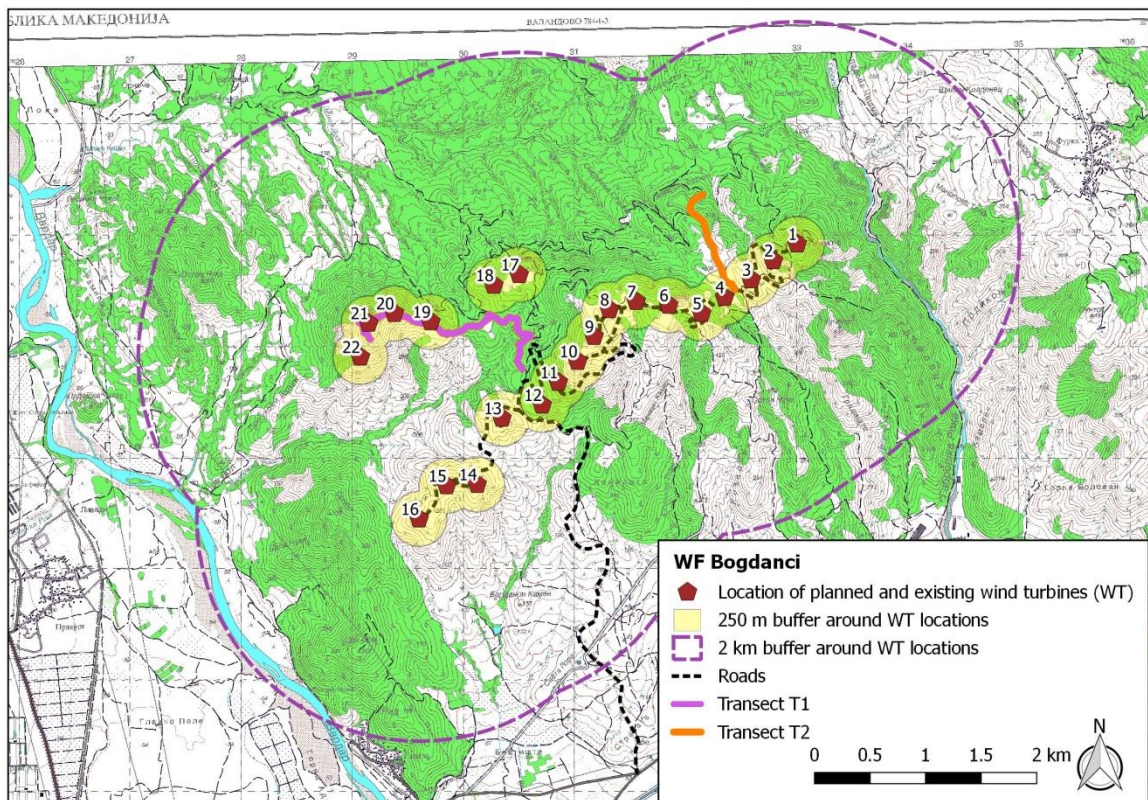*Figure 6* *Location of Vantage points (VP) at WF Bogdanci*

Figure 7 *Location of transects (T1 and T2) at WF Bogdanci*

5   Potential problems or deviations from the Working Programme

Problems or deviations from the Project time schedule did not occur.

6   Conclusion

From 21st February to 1st June 7 field visits were performed – 7 for bird survey, 3 for bat survey, and 1 for habitat survey. According to the Project plan, bat and bird teams were at the WF location (constructed and planned) every month and habitat team has performed field visit in May/June.

Fieldwork for Habitat survey was conducted as planned, during the optimum period for the field mapping, as the vegetation in the project area is now fully developed. Based on the results of the field survey and the verification of the preliminary habitat map, the final habitat map will be produced.

From December 2017 the continuous bat activity monitoring has been conducted. Bat team is collecting data from the installed detectors at nacelle height every month. As a part of bat activity survey, bat calls (echolocation) were recorded along the linear transect, at least once in a month (once in March and April, and twice in May). Bat survey also included reconnaissance and identification of potentially significant bat roosts. Important roost site Rudnik Sv. Nedela was recorded 1,8 km from WF Bogdanci and approx. 3 km from the location of the future extension, and has been regulary investigated each month. Abundance of bats was estimated visually, using photography. Species composition was determined visually and with the use of ultrasound detectors.

Bird team has conducted Observation sites method during the migration season, and Vantage points method and Distance sampling method during the nesting season of birds. As expected, higher bird activity was recorded from March to June than during the wintering period (February). Until the end of the nesting season the same methodology will be used for nesting species. During the autumn migration season (that starts in August) a new OS will be defined and conducted. Observation sites will be located to visually cover the whole northern areas, since the migration is expected to come from that direction.

Next Progress Report will present the progress of the Project in the next 4 months period, and will be submitted in October 2018.

7   Project progress bar

Post-construction time progress bar

33,33 %	

Baseline study time-progress bar

47 %	