



Action A8 detailed methodology

A8 vantage point surveys

Task – Vantage point study on the impact of wind farms on the behavior, distribution and intensity of use of the area of Coastal Dobrudzha, by Red-breasted Geese and other potentially sensitive bird species e.g. other geese, swans, ducks, pelicans, storks and large raptors.

Background

The scale of proposed wind farm developments in Dobrudzha represents a serious threat to wintering Red-breasted Geese due to their planned development in known important feeding areas for internationally important numbers of Red-breasted Geese. Many wind turbines are already installed and operational in the southern part of the region with many more proposed across the region, particularly to the west of Durankulak SPA. For this reason it is important to understand the current use of the region by target species, particularly the numbers and major flight routes used.

The aim of this study is to collect data on the use of the coastal Dobrudzha area by species thought to be most at risk from wind farm development in the region. The study will allow the assessment of the likely displacement of birds, particularly Red-breasted Geese, from feeding areas, and the potential barrier effects posed by wind farms, affecting the use of inland areas for feeding.

The data, together with that collected in other activities under the project such as transect surveys and telemetry data, will enable the mapping of sensitive areas for Red-breasted Geese in Coastal Dobrudzha. The sensitivity map may also aid the identification of sites for establishment of an agri-environment scheme for Red-breasted-Goose-friendly agriculture.

This study began in winter 2011/12, and was originally aimed at getting a broad picture of goose flight routes across the area. In winter 2012/13 the methods have been adapted to give a better understanding of potential barrier effects occurring in the area, potentially due to constructed wind farms.

This activity will use vantage point (VP) watches to quantify the flight activity of geese and other bird species of conservation importance e.g. raptors, in Coastal Dobrudzha. VP watches will be carried out at 15 VPs stretching down the coastline from the Romanian border south to Kaliakra, and situated between major roosts and inland agricultural lands used by geese for feeding. The main concentration of VPs is around and within the wind farms in the southern part of the region.

Vantage point surveys

Aims

1. Estimate overall relative intensity of bird flight activity by VP

Requires quantified, unbiased effort across all VPs. This to be achieved by attempting to count **all birds** (of relevant species), rather than by a systematic sampling approach. Need to account for sources of bias such as variable visibility (map areas that cannot be viewed from the VP) and temporal factors (season, time of day, hunting).

It is likely that the probability of detection decreases as bird flight intensity increases, thus tending to cause a bigger under-estimate of total numbers in busy VPs than in quiet VPs. This might be resolvable by using a distance-sampling approach in analysis, using a separate detection function for each VP. However, the latter might introduce large variance, since there might be a relatively small number of flocks per VP, hence the detection function might be rather imprecise.

2. Map flight directions/heights within each VP

Requires a sample of directions and heights that is unbiased with respect to observation conditions (e.g. weather) or direction/height (i.e. not selecting flocks according to what they are doing, where they are going).

3. Map intensity of flight activity within each VP

Requires the sampling of flock locations to be unbiased with respect to where they are in the VP. If all flocks are mapped for their complete course through the VP by means of multiple point locations at relatively short time-intervals then this would be fine. If however there are periods when some flocks are being recorded only as single point locations, because of high rates of bird activity, then there is a problem that these single points are likely to be biased. e.g. Flocks tend to be first detected when distant and when coming from roost; if recorded only once then that will be a distant observation in the direction of the roost, which will not reflect overall use of air space in the VP, since the flock will subsequently move through the VP to a greater or lesser extent.

One way to avoid this problem would be to omit those flocks that were recorded as single point locations during overload periods from the mapping process.

Methodology

Target species

The key target species for priority in this study is the Red-breasted Goose. Other wintering species should also be recorded, which are listed below in order of priority. (Codes for input on the form are also given.)

Priority	Code	Taxon	English name
1	BRRUF	<i>Branta ruficollis</i>	Red-breasted Goose
2	ANALB	<i>Anser albifrons</i>	White-fronted Goose
2	ANERY	<i>Anser erythropus</i>	Lesser White-fronted Goose
2	ANANS	<i>Anser anser</i>	Greylag Goose
2	ANSER	<i>Anser</i> or <i>Branta</i>	Goose – not identified to species level
3	CYCYG	<i>Cygnus Cygnus</i>	Whooper Swan
3	CYCOL	<i>Cygnus columbianus</i>	Bewick's Swan
3	CYOLO	<i>Cygnus olor</i>	Mute Swan
3	CYGNU	<i>Cygnus</i> sp	Swan – not identified to species level
3	ANATI	<i>Anatinae</i>	Duck – not identified to species level
4	PECRI	<i>Pelecanus crispus</i>	Dalmatian Pelican
4	PEONO	<i>Pelecanus onocrotatus</i>	White Pelican
4	BUBUT	<i>Buteo buteo</i>	Common Buzzard
4	BULAG	<i>Buteo lagopus</i>	Rough-legged Buzzard
4	BURUF	<i>Buteo rufinus</i>	Long-legged Buzzard
4	BUTEO	<i>Buteo</i> sp	Buzzard – not identified to species level
4	CIAER	<i>Circus aeruginosus</i>	Marsh Harrier
4	CICYN	<i>Circus cyaneus</i>	Hen Harrier
4	CIRCU	<i>Circus</i> sp	Harrier – not identified to species level
4	HAALB	<i>Haliaeetus albicilla</i>	White-tailed Eagle
4	FACHE	<i>Falco cherrug</i>	Saker Falcon

Target species have been selected based on the following criteria:

1. Species regularly¹ using open areas of Coastal Dobrudzha for foraging where birds forage entirely on the land (geese, swans and ducks)
2. Species regularly using open areas of Coastal Dobrudzha for foraging, where the birds spend considerable time in the area flying low, but also land fairly frequently (raptors)
3. Species regularly landing in open areas of Coastal Dobrudzha for significant amounts of time during the day or night, for foraging or roosting (geese, swans and ducks)
4. Species that use predictable corridors for their regular movements during winter.
5. Species with unfavorable conservation status that should be subject of specific measures of protection under art. 4.1 and 4.2 of the Birds Directive
6. Species known to be vulnerable or potentially vulnerable to wind farm development.

¹ "Regularly" is related to the period where the birds are present in the area and is used, as it is defined by the Ramsar Convention guidance;

Study area

A total of 15 vantage points have been selected across coastal Dobrudzha, chosen according to the following specifications:

- 1. Three points in the north of the area located between major roosts of Durankulak and Shabla lakes and agricultural feeding areas (VPs Zahari Stoyanovo, Smin and Ezerets, Map 1 below).**

In winter 2011–12 we observed a large-scale distribution pattern, with high intensity of goose traffic occurring in the north of the area around the freshwater lakes. It is logical to assume this was related to distribution of roosting numbers. However, more investigation is required to increase the available evidence that flight activity at VPs is explicable by roost proximity/size. More complete coverage of roost sites on roost count days, as well as a similar spread of VPs from north to south should help to achieve this.

- 2. Twelve points spread across the south of the area, along the coast from Shabla lighthouse round to Kavarna, around the AES wind farm, and in agricultural land to the north of AES wind farm.**

This distribution of points will allow us to get a better understand the nature of any barrier effects occurring in the part of the region where most of the wind farms are located. VPs along the coastline will allow early detection of early deviations e.g. birds flying around the coast from roosts on the sea rather than over land. Points located inland and around the wind farms will measure flight activity of those flocks choosing to fly in closer proximity to turbines. Do birds choose to go over, through or around wind farms? Those points located further inland, behind wind farms may show differences in flight activity to that expected from habitat suitability modelling.

- 3. Balgarevo VP**

This point was surveyed in winter 2011/12 and is unique in that this is the only VP where turbines have been constructed between seasons. As such, this point may serve as a before-after construction study and as such will undergo repeated survey effort at a similar intensity to last year.

Timetable/fieldwork schedule

The fieldwork will run for approximately 8 weeks from early January 2012 to late February 2013, (proposed dates are **6th January to 5th March**) the main period of activity for wintering geese (see proposed schedule of fieldwork in Appendix I). Each VP will be visited approximately 10 times throughout the eight week period. All but one VP will be visited during the first three hours of daylight, the main period of activity for wintering geese. Balgarevo VP will be visited more intensively, for 4 x 2 hour periods per visit i.e. for a whole day at each visit. During the hunting season, the schedule will allow all VPs to be covered on at least one hunting day and non-hunting day.

Observers will use their free afternoons to enter the data gathered during the morning into electronic format, as well as taking part in the displacement study.

Summary of survey periods

- **Survey period** – 7 Jan to 5 March 2013
- **Duration** – approximately 8 weeks
- **Number of visits per VP** – 10
- **Duration and time of watches** – 3 hours from dawn, around 7–10am. At Balgarevo VP, 8 x 2 hour watches – 7–9am, 10–12am, 1–3pm and 4–6pm
- **Number of hours per VP** – 30 (80 at Balgarevo)

Fieldwork protocol

Defining the visible area

Before the start of the field study the visible parts of the area are determined and marked on a map with scale 1:25,000. The distances to all visible, well visible and constant landscape features, including wind turbines, from the VPs will be measured, and the measurements included in a “reference map” for each VP.

The heights of the visible landscape features that could be used for reference orientation in height measurements– buildings, pylons, retranslation facilities, wind protection belts, etc. are estimated as accurately as possible and the heights of these features recorded onto the reference map.

The exact location of the VPs are marked on the terrain (with stones for example), as well as the main directions (N, W, S, E, NE, NW, SW, SE).

Survey form and maps

When in the field, data will be entered onto two different forms to allow systematic and clear recording of information. These include a detailed map of the search area for each VP, on which observers plot the locations of target species (see below). Instructions will be provided during training on how to fill in the forms.

General methods

There are two basic methods of survey:

1. Total counts – which assesses the total numbers of birds passing through the VP.
2. Flightlines – which follows the route taken by individual flocks through the VP.

One observer in the team will concentrate on 'total counts', and the other on 'flightlines'. There is a separate recording form for each method. Each observer is likely to use several forms during the survey period on one day.

'Total counts' aims to record **all** flocks of target species passing through the VP. The observer must scan the whole VP to do this. When bird activity is particularly busy, prioritise geese over other waterbirds over raptors.

'Flightlines' follows individual flocks continuously as they pass through the VP. It is not possible to observe other flocks at this time, so the flightline survey constitutes a sample survey (only a proportion of flocks are followed). Care should be taken to avoid biases when selecting flocks for this survey. (You will be advised how to select flocks to follow.)

General process

1. On arrival at the point observers should note the name of the VP, the date, and name of the observer at the top of the first form. This information should be completed for **each form** used. Write '1' in the space for 'map number' on the first form.

Total counts

2. Observers record weather data on the form. If there are significant changes in the weather over the duration of the watch, a new form should be started and the new weather information completed.
3. Record the time at which you start the survey in 'time start' at the top of the form. When you stop the survey, record the time in 'time end'. (See also 'changing to a new form', and 'taking a break' below.)
4. The observer scans in all directions until a target species is detected.
5. On initial detection of a flock, the observer records the number of species in the flock and the height of the flock in the table. The observer also marks the position of the flock on the map using the flock ID letter, and the direction of travel (indicated using a small arrow on the map; if you prefer, you can write the direction in the column 'Direction' as N, NE, SW *etc.*).
6. There is no need to record the same flock again. Care may be needed to avoid counting the flock same flock twice, especially when the flock has moved to a very different position in the VP. Some errors will be unavoidable – don't worry too much, especially when it is very busy. Note: if a flock leaves the VP and later returns, it should be recorded again.
7. There is no need to record the precise time at which flocks are seen. However, it is useful to record the time at regular intervals, so that we are able to determine when the main passage of birds occurs (for example, if most birds pass between 7 and 8am, or after 9am). Please record the time roughly every half hour in the column 'time'. For example, if you have reached flock K on form 1 at half past seven, write 07:30 in the time column after flock K. If it very busy at 07:30, don't worry about recording the time then – wait for slight quiet period and then record the time (perhaps it is 07:40 after flock T).

Flightlines

8. The other observer follows the path of a selected flock as it crosses the VP.
9. The flock to be followed is chosen by the 'total counts' observer – they will be identifying the species in all flocks, so can point the 'flightline' observer onto flocks of priority species.
10. The 'total counts' observer will give the ID for the selected flock. This is a combination of the 'total counts' map number and flock letter. For example, if flock F on the first map is selected, mark '1F' on the flightlines map; for flock S on map 3, write 3S (number then letter).
11. Circle this ID on the flightlines map at the location it is first observed. The 'flightlines' observer should use the same location marked by the 'total counts' observer on their map, even though the flock is likely to have moved a little way from there by the time the 'flightlines' observer first sees it. This approach ensures that the flock has the same initial location on both maps.
12. Once selected, the location and height of the flock are recorded at regular intervals – roughly every 15-20 seconds. This information is plotted on the map by recording the height band (0, 1, 2 or 3, see below) at the relevant location.
13. The flock is followed until it leaves the VP. Ideally, there would be 6 to 10 locations and heights for each flock.
14. Once the flock has left the VP, the observer draws a line joining all the height bands (the line should be drawn slightly to the side of the numbers). This avoids confusion when plotting additional flocks to know which locations are for which flocks.
15. Once the flock leaves the VP, the 'flightline' observer lets the 'total counts' observer know, and the 'total counts' observer will select a new flock to be followed.

Detail

Search radius - Observers attempt to cover 360° at all times. Although when searching for 'new' flocks observers are likely to spend more time looking in the direction of the predominant 'source' of birds, they must keep in mind the need to search all around.

Flock size – When counting numbers of birds in the flock, it is not important to have a very accurate count (as, say, when making roost count). It is important to record all flocks passing through the VP so, especially when it is busy, only an estimate of numbers is needed. A count within 10-20% of the true total is more than sufficient. So, aim to use the following levels of accuracy:

- **flock size of 1-50 birds** – count accurate to the nearest 5 birds
- **50-100 birds** – accurate to the nearest 10

- **100-200 birds** – accurate to the nearest 20
- **200-500 birds** – to nearest 50
- **500-1500 birds** – to nearest 100
- **1500+ birds** – to nearest 500

Flight height – this is recorded in height bands. These are broadly aimed at being ‘beneath the height swept by rotor blades, ‘within the height swept by rotor blades’ and ‘above the height swept by rotor blades’. There are turbines of different heights in the study area, so these bands correspond approximately to <40m, 40-150m, >150m (<40m is below the rotor height of the smaller turbines, >150m is above the rotor of the larger turbines).

Use the following codes to indicate the height band on the form:

- 0 = birds/flocks that land
- 1 = <40m
- 2 = 40-150m
- 3 = >150m

Priority species - The priority is to record all geese. This takes precedence over all other bird taxa. Other waterbirds and raptors can be recorded, using the same methods, when time permits. Waterbirds should take priority over raptors. (See the section ‘Target species’ above).

When selecting flocks for flightline survey, goose flocks with a higher proportion of Red-breasted Geese take priority.

Recording the species - Geese often occur in mixed species flocks, mainly of Red-breasted Geese and Greater White-fronted Geese. For mixed flocks, space is provided to record numbers of Red-breasts and White-fronts separately (columns ‘RbG’ and ‘WfG’).

If there are significant numbers of a third species in the flock, this can also be recorded – the species code should be entered on the form in the column ‘other’, and the number of birds given. (See the table in the section ‘Target species’ for species codes.)

If a flock contains other species (ducks, raptors *etc*), the species code and number of birds should be written in the ‘other’ column.

Some flocks will contain more than three species of geese, but this detail is not required for this survey. If you observe a flock of four or more species, please list the most numerous species on the form (even if this means ignoring the rarity!)

When the survey is very busy, you do not need to identify the species precisely, as this will use valuable time that should be used to record additional flocks. For example, flocks of geese do not need to be identified to species if this is difficult or will take a long time, *eg* when they are very distant, or are mixed, or when light conditions are poor. The flock can simply be recorded as geese, rather than spending time trying to separate the Red-breasts from the White-fronts. In this case, write ‘ANSER’ (the code for unidentified goose species) in the ‘Other’ column, and give the number as the total flock size. Similarly, don’t spend time trying to identify then species of buzzard if conditions are not suitable – simply record ‘BUTEO’ and concentrate on locating more flocks.

When conditions are less busy, you can spend additional time counting numbers of each species in mixed flocks, identifying the species of buzzard or harrier using a telescope, *etc.* Remember, the priority is to record all flocks for 'total counts'.

When is a flock a flock – or more than one flock? Birds that are tightly grouped and evenly spaced are obviously just one flock. Birds may be spaced out as several discrete groups, with large gaps (20m or even more) in between – but should be considered as one flock if they are behaving in a similar way (flying in the same direction, following one another's movements). This is a subjective assessment – so please use your expertise as a regular goose observer! If it is really busy, group close birds into larger flocks to help ensure you record them all.

Merging/splitting flocks – If during 'flightline' survey, a flock splits into two (or more) separate flocks, this should be recorded. A split should only be recorded where a sizeable number of birds is involved – if only a handful of birds leaves the main flock, or if 100 birds leaves a flock of more than 1000 birds, don't worry about recording this as a split.

Write 'S' on the map where the flock splits.

If you find it possible, continue to follow both flocks separately (plotting their location and height – though the intervals may be slightly longer than before as you change between flocks). But if this is too confusing, or the flocks take very different routes so that you cannot follow both, continue to follow the *larger* of the new flocks. (Still write 'S' on the map, even if you never follow the smaller flock.) If possible, annotate the form to record the numbers of birds in the new flock(s) that you follow.

If the flock you are following merges with another flock, write 'M' on the form. Continue to follow this new larger flock as before.

Changing to a high priority flock – You should aim to follow priority species. If, however, you have already followed mainly low priority flocks (small goose flocks, buzzards *etc*) and a large flock of Red-breasts is detected by the 'total counts', you can stop recording the buzzard you are following and switch to the new flock. Plot an 'X' on the map to show that you stopped recording information for this 'flock'. Make sure you communicate closely with your fellow observer to know when this change would be useful. Remember: we do want a range of different flocks to be followed – including small flocks and some raptors – so the change to a high priority flock should be made only when you have few records of such flocks on that survey.

Defining location of flock – Observers should use the location of the lead bird for the assigning of flock locations.

Landing flocks - When a flock lands, the height band is recorded as '0'. This is placed on the map showing the location of the centre of the flock on the ground. If the flock takes off again reasonably quickly, you should continue to record information about it as before. If the flock looks settled and likely to remain on the ground for more than a minute, ask the other observer for a new flock to follow. There is no need to record further information for this flock, even if it takes off again at some point in the future.

Changing to a new form – Space is provided on the ‘total counts’ form for 26 flocks (IDs A to Z). When this is completed, change to a new form.

On the new form, write the next number in space for ‘map no.’ (If it is the second sheet you have used that day, write ‘2’, *etc*). Write the time at which you started using the new form in ‘time start’. Leave the box for ‘time end’ blank on the previous form – only give a time in ‘time end’ if you stop surveying (see below).

Please complete information on wind direction, wind speed, visibility *etc*. If, however, conditions are busy, concentrate on recording and mapping flocks, and return to complete this information when it is quieter. (Just write the ‘map no.’ immediately, so there is no confusion.)

Please change to a new form before the current form is complete if this is useful. For example, if the map is already cluttered or looking messy, change to a new form. (Please change to a new form if there is a significant change in weather – even if you have not used all flock IDs.) Similarly, change to a new form for the flightline counts when you feel it is appropriate. You should be able to plot information for three or four flocks, and in some cases six, seven or even eight, on some maps. But once it looks cluttered, or if several flocks have crossed over or followed similar paths, please change to a new map. Record information for the observer, date and ‘map no.’ on the new form before starting to plot the next flock.

Weather data – the following meteorological information should be recorded on the forms:

- Wind direction (as N, NE, E, SE, E, S, SW, W or NW);
- Wind speed (0 to 8, using the Beaufort scale – a table is provided at the end of this document);
- Visibility – as the distance to which birds can be clearly seen, to the nearest kilometre (if visibility is 10km or better, give the value as 10);
- Rain and Snow – circle whether Heavy, Medium, Light or None.

Breaks in survey – It is important that data is collected continuously throughout the count window. If, in extreme conditions, a short break is necessary or you stop the survey for any reason, it is **essential** to note the time at which you stop the survey in ‘time end’ so that this can be taken into account in the analysis.

Breaks are useful to help with survey efficiency. If it is a particularly intense survey, with lots of flocks in quick succession, you may suffer from fatigue after a while and the quality of data (*eg* your ability to detect flocks or count them) will diminish. If you notice this, it is better to stop, take a five-minute break – take a drink of water, stop looking at birds, and relax. When you resume the survey, you will be refreshed and the data quality will be better again.

As a guide, perhaps take a break of 5 minutes every hour, if needed. Certainly, do not take a break of more than 15 minutes, as this will be a significant hole in the data. If the survey is quite quiet, you may find that you can complete the survey without any breaks.

There is no need to continue the survey beyond the scheduled end time (10am for most VPs) to make up for time ‘lost’ due to breaks. When you restart the survey, use a new form and complete the all relevant information at the top of the form.

There is no need to record the end time if the 'flightline' observer takes a break – that survey is only a sample, and we can determine the sample by comparing the flocks followed with the information in 'total counts'.

Observers should not sit in their vehicles during active counts, due to the need to scan the whole VP and record data even in bad weather.

Ending the survey – when you complete the survey, write the time you stop in 'time end' on the last form you are using for 'total counts'.

Before you leave the field, both observers should check that all forms are safely stored. Write the total number of forms after each 'map no.'. For example, if five forms were used for 'total counts', write '/ 5' after the map number on all forms, *eg* '1 / 5' on the first form, '2 / 5' on the second. This ensures that when inputting data, we know that we have all forms from the survey or if the last one has gone missing. Do the same for the 'flightline' forms, using the appropriate number to indicate how many forms were used for that survey.

Setup and equipment

- Paper forms and maps – If possible, we would have A3 sheets printed/photocopied with map on the left and table on the right.
- 3 A3 weather writer clip boards (one per team)
- 3 digital stop-clocks (one per team),
- Binoculars (6 pairs)
- 3 Telescopes (one per team)
- 3 compasses (one per team)

Post-survey

On completion of a vantage point data sheets and maps should be ordered and checked for errors/omissions. The scientific advisor will check forms regularly so that any mistakes can be identified and fed back to observers, with the aim of improving data quality on future visits.

Fieldworkers should feed back to the scientific advisor and conservation officer regularly about the numbers and whereabouts of geese they have observed. This information will be invaluable for other fieldwork activities such as catching and the goose displacement study.

Data entry and validation

Survey data should be entered into the Excel spreadsheet NO LATER than ONE WEEK after completion of a visit. Any delays should be reported to the scientific advisor, who may provide further help if necessary. The database will be validated regularly so that any issues can be identified and overcome.

Important points

Low numbers of geese in the area

Fieldworkers should continue with the fieldwork schedule unless told otherwise by the conservation officer/scientific advisor. They should feed back to the conservation officer **on a daily basis** about what they have seen in the area.

Unable to access vantage points

Reduced access to vantage points under extreme conditions is expected and while every effort should be made to access the vantage points, collecting data should not be prioritised over personal safety. Where practical, extra visits will be scheduled to make up for lost coverage.

If a vantage point is particularly difficult to access, but others are more accessible, the order of visits may be changed to allow time for access to improve. The scientific advisor should be consulted before any changes are made.

Appendix I – Proposed schedule of vantage point and displacement study fieldwork

Date	Day	A1 roost count days	A8 Vantage points and displacement study					
			Team 1 (Aleksander)		Team 2 (Valchin)		Team 3 (Mihail)	
			AM	PM	AM	PM	AM	PM
01-Jan	Tuesday		New Year					
02-Jan	Wednesday							
03-Jan	Thursday							
04-Jan	Friday		Arrival/training					
05-Jan	Saturday		Training					
06-Jan	Sunday							
07-Jan	Monday		Kavarna	data entering	AES St Nikola WF	data entering	St Nikola	data entering
08-Jan	Tuesday		Rakovski	data entering	HDimitar	data entering	Tyulenovo	data entering
09-Jan	Wednesday		Gorichane	data entering (training)	Gorun	data entering (training)	Shabla	data entering (training)
10-Jan	Thursday		Ezerets	data entering (training)	Smin	data entering (training)	Zahary Stoyanovo	data entering (training)
11-Jan	Friday		X	X	X	X	X	X
12-Jan	Saturday	Roost count	Rusaika	data entering / displ	Kaliakra	data entering / displ	Balgarevo	Balgarevo
13-Jan	Sunday	Roost count	St Nikola	data entering	Kavarna	data entering	AES St Nikola WF	data entering / displ
14-Jan	Monday		Tyulenovo	data entering / displ	Rakovski	data entering / displ	HDimitar	data entering
15-Jan	Tuesday		Shabla	data entering	Gorichane	data entering	Gorun	data entering
16-Jan	Wednesday		Zahary Stoyanovo	data entering	Ezerets	data entering	Smin	data entering
17-Jan	Thursday		Balgarevo	Balgarevo	Rusaika	data entering / displ	Kaliakra	data entering / displ
18-Jan	Friday		X	X	X	X	X	X
19-Jan	Saturday		Gorun	data entering / displ	Shabla	data entering / displ	Gorichane	data entering / displ
20-Jan	Sunday		AES St Nikola WF	data entering	St Nikola	data entering	Kavama	data entering
21-Jan	Monday		HDimitar	data entering / displ	Tyulenovo	data entering / displ	Rakovski	data entering / displ
22-Jan	Tuesday		Smin	data entering	Zahary Stoyanovo	data entering	Ezerets	data entering
23-Jan	Wednesday		Ezerets	data entering	Smin	data entering	Zahary Stoyanovo	data entering
24-Jan	Thursday		Gorichane	data entering / displ	Gorun	data entering / displ	Shabla	data entering / displ
25-Jan	Friday		X	X	X	X	X	X
26-Jan	Saturday	Roost count	Kaliakra	data entering / displ	Balgarevo	Balgarevo	Rusaika	data entering / displ
27-Jan	Sunday	Roost count	Rakovski	data entering / displ	HDimitar	data entering	Tyulenovo	data entering
28-Jan	Monday		Kavarna	data entering / displ	AES St Nikola WF	data entering	St Nikola	data entering / displ
29-Jan	Tuesday		Zahary Stoyanovo	data entering	Ezerets	data entering	Smin	data entering
30-Jan	Wednesday		Shabla	data entering / displ	Gorichane	data entering / displ	Gorun	data entering / displ
31-Jan	Thursday		Tyulenovo	data entering	Rakovski	data entering / displ	HDimitar	data entering
01-Feb	Friday		X	X	X	X	X	X
02-Feb	Saturday		St Nikola	data entering	Kavarna	data entering	AES St Nikola WF	data entering
03-Feb	Sunday		Rusaika	data entering / displ	Kaliakra	data entering / displ	Balgarevo	Balgarevo
04-Feb	Monday		Smin	data entering	Zahary Stoyanovo	data entering	Ezerets	data entering
05-Feb	Tuesday		Gorun	data entering / displ	Shabla	data entering / displ	Gorichane	data entering / displ
06-Feb	Wednesday		HDimitar	data entering	Tyulenovo	data entering	Rakovski	data entering
07-Feb	Thursday		AES St Nikola WF	data entering / displ	St Nikola	data entering / displ	Kavama	data entering / displ
08-Feb	Friday		X	X	X	X	X	X
09-Feb	Saturday	Roost count	Balgarevo	Balgarevo	Rusaika	data entering / displ	Kaliakra	data entering / displ
10-Feb	Sunday	Roost count	Ezerets	data entering	Smin	data entering	Zahary Stoyanovo	data entering
11-Feb	Monday		Gorichane	data entering	Gorun	data entering	Shabla	data entering
12-Feb	Tuesday		Rakovski	data entering / displ	HDimitar	data entering / displ	Tyulenovo	data entering / displ
13-Feb	Wednesday		Kavama	data entering	AES St Nikola WF	data entering	St Nikola	data entering
14-Feb	Thursday		Kaliakra	data entering / displ	Balgarevo	Balgarevo	Rusaika	data entering / displ
15-Feb	Friday		X	X	X	X	X	X
16-Feb	Saturday		Zahary Stoyanovo	data entering	Ezerets	data entering	Smin	data entering
17-Feb	Sunday		Shabla	data entering / displ	Gorichane	data entering / displ	Gorun	data entering / displ
18-Feb	Monday		Tyulenovo	data entering	Rakovski	data entering	HDimitar	data entering
19-Feb	Tuesday		St Nikola	data entering / displ	Kavarna	data entering / displ	AES St Nikola WF	data entering / displ
20-Feb	Wednesday		Rusaika	data entering / displ	Kaliakra	data entering / displ	Balgarevo	Balgarevo
21-Feb	Thursday		Smin	data entering	Zahary Stoyanovo	data entering	Ezerets	data entering
22-Feb	Friday		X	X	X	X	X	X
23-Feb	Saturday	Roost count	Balgarevo	Balgarevo	Rusaika	data entering / displ	Kaliakra	data entering / displ
24-Feb	Sunday	Roost count	Gorun	data entering	Shabla	data entering	Gorichane	data entering
25-Feb	Monday		AES St Nikola WF	data entering	St Nikola	data entering	Kavama	data entering
26-Feb	Tuesday		HDimitar	data entering / displ	Tyulenovo	data entering / displ	Rakovski	data entering / displ
27-Feb	Wednesday		Kaliakra	data entering / displ	Balgarevo	Balgarevo	Rusaika	data entering / displ
28-Feb	Thursday		Kavama	data entering / displ	AES St Nikola WF	data entering	St Nikola	data entering / displ
01-Mar	Friday		Rakovski	data entering / displ	HDimitar	data entering / displ	Tyulenovo	data entering / displ
02-Mar	Saturday		Gorichane	data entering	Gorun	data entering	Shabla	data entering
03-Mar	Sunday		Ezerets	data entering	Smin	data entering	Zahary Stoyanovo	data entering
04-Mar	Monday		Kaliakra	data entering	Balgarevo	Balgarevo	Rusaika	data entering
05-Mar	Tuesday		Data entering / VP visits (reserve)		Data entering / VP visits (reserve)		Data entering / VP visits (reserve)	

Beaufort Scale

Indicate wind speed using 0 to 8 from the Beaufort Scale:

Scale	Wind speed (knots)	Definition	Visible effects
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Twigs breaking off trees, generally impedes progress