ACTION A5. DESCRIPTION OF TARGET ROAD SEGMENTS, IDENTIFICATION OF CROSSING POINTS USED BY ANIMALS AND ANALYSIS OF TRAFFIC VOLUME AND SPEED

ACTION REPORT/2020 – Romania

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LIFE SAFE CROSSING
PREVENTING ANIMAL-VEHICLE COLLISIONS

NATURA 2000

ICAS

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1. INTRODUCTION

The aim of the action A5 was to define the sites where to install the prevention devices foreseen in Action C1.

For this reason in the project proposal we foresaw to monitor 87 Km of roads in the project area.

In the frame of this action the activity carried out were the followings:

- Characterization of the selected road segments;
- Monitor the wildlife road mortality;
- Monitor crossing points used by animals;
- Monitor traffic volume.

The action A5 lasted from January 2019 to September 2020

2. PROJECT AREA

The project area, located in the central area of Romania, in South-Eastern Carpathians, hosts the highest density of the brown bear population of the country.

The monitored road segments have a total length of 120 Km, therefore we monitored 33 Km more than was originally foreseen.

The selected monitored segment were (tab. 1 and fig. 1):

- DN1 Brasov – Comarnic: DN 1 it's the main road from Brasov to Bucharest it crosses an important area for the brown bear population, being located between 2 of the biggest Natura 2000 sites in the project area, and also being one of the most crowded roads in Romania.
- DN1A Cheia - Brasov is an alternative of the DN1 being used in daytime for the big trucks, and in weekend for lowering the car numbers from DN1.
- DN13 Padurea Bogatii - Brasov is the main road, which connects Brasov from the central part of the country.
- DN1 Vladeni Brasov is also a very busy road, being also part of the main road from Bucharest to the border to Hungary.

Road code/nr.	Length of segment
Padurea bogatii, DN13	20km
Brasov - Comarnic DN 1	40km
DN 1 A – Cheia-Brasov	40km
Brasov - Vladeni E68, DN1	20km

Table 1. List and length of the monitored road segments.

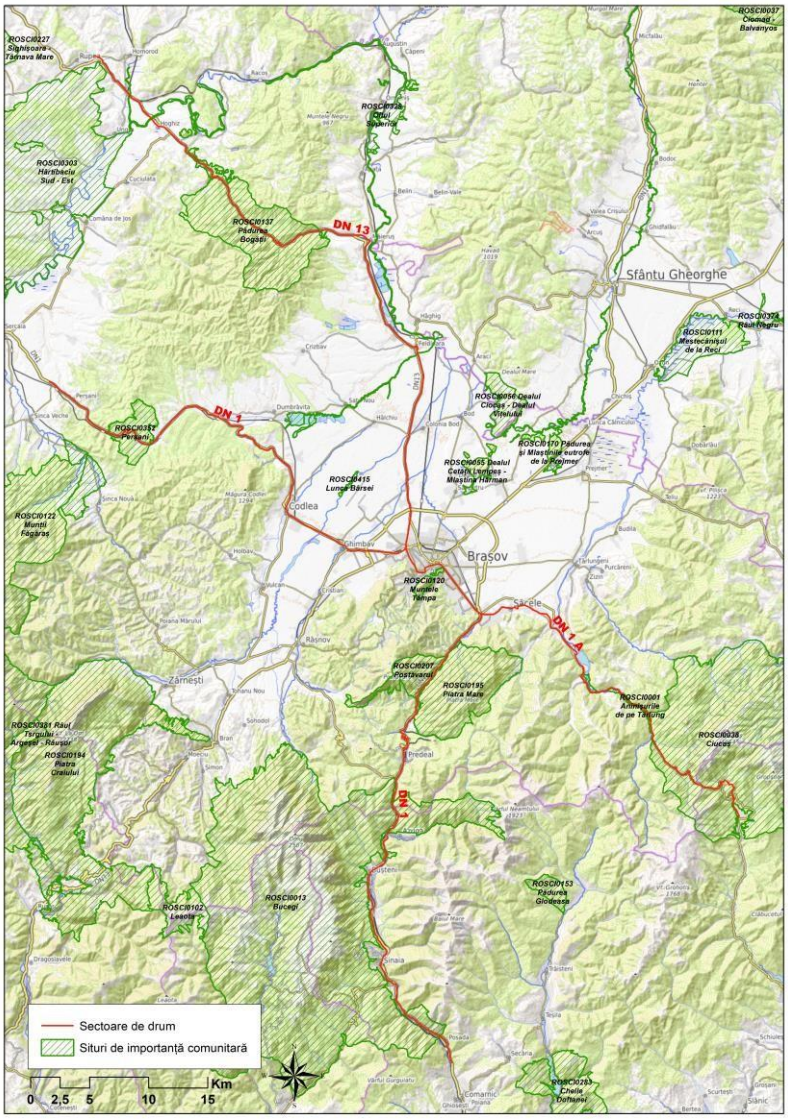

Figure 1: Road segments monitored in the project area.

3. METHODS

Characterization of the road segments

The characterization of the selected roads segment consisted in GIS analysis and specific field surveys to measure different parameters of the road, in order to evaluate the permeability to animal movements.

For each road segments we evaluated:

- Number of lanes;
- Speed Limit;
- Number of wildlife crossing signs;
- Road transversal section;
- Habitats included in the 400 meters on both sides of the road;
- Presence and length of barriers to animal movements.

The fieldwork to measure the fore mentioned parameters was made between January and February 2019.

The presence and length of the barriers were measured according to the protocol presented in Appendix I.

All the data collected were stored in a specific database.

Monitoring road wildlife mortality

The selected road segments were travelled 2 times/month in order to register the animals found dead on the road. We collected data regarding all the different species of mammals. The main variables registered were: species and geographical coordinates of the findings.

Due to Covi-19 restrictions we had to stop the systematic monitoring of the selected road segments from March to May 2020.

Data collection was standardized following the indications agreed among all the other partners.

Monitor crossing points used by animals

In order to identify the crossing points used by the animals, it was foreseen to use the camera traps to identify and monitor the passages most used by animals, but

due to the high risk of the cameras, we choose to make several snow-tracking sessions during the winter months.

Two days after the snowfall we surveyed each road segments in order to record the tracks of the animals on both side of the roads. In this way we were able to identify the crossing points used by the different wildlife species along the whole length of the road segment. The fieldwork involved a total of 20 people.

Traffic volume

Traffic volume in the selected road segments was measured trough the installation of specific devices. These devices measure in a continuous way the passages of the different vehicles. Each device was checked every 3-5 months to monitor batteries level. The devices were putted under the ground level.

The results were downloaded in the field and allowed us to measure: hourly, daily weekly, monthly and yearly average passages.

3. RESULTS

Characterization of the road segments

The four selected road segments were all 2 lanes roads managed by the State, and the road transversal section was mainly flat for the whole length of the road segments. Speed limits vary from a minimum of 30 Km/h to 90 Km/h (table 2)

Road code/nr.	Road type	N. of lanes	Road transversal section	Speed limit	Number of wildlife crossing signs
Padurea bogatii, DN13	State	2	Flat	30-90 Km/h	2
Brasov - Comarnic DN 1	State	2	Flat	30-90 Km/h	4
DN 1 A – Cheia-Brasov	State	2	Flat	30-90 Km/h	4
Brasov - Vladeni E68, DN1	State	2	Flat	30-90 Km/h	3

Table 2. Main parameters of the monitored road segments.

The anlalys of the different habitat categories present in the 400 meters on both side of the road is shown in table 3.

ID sector	Road code	Sector	Code CLC	Habitat	Ha
1	DN 1A	Brasov - Cheia	112	Discontinuous urban fabric	481.01
1	DN 1A	Brasov - Cheia	121	Industrial or commercial units	45.99
1	DN 1A	Brasov - Cheia	142	Sport and leisure facilities	30.34
1	DN 1A	Brasov - Cheia	211	Non-irrigated arable land	73.92
1	DN 1A	Brasov - Cheia	231	Pastures	333.31
1	DN 1A	Brasov - Cheia	242	Complex cultivation patterns	108.62
1	DN 1A	Brasov - Cheia	243	Land principally occupied by agriculture, with significant areas of natural vegetation	99.77
1	DN 1A	Brasov - Cheia	311	Broad-leaved forest	1,016.40
1	DN 1A	Brasov - Cheia	312	Coniferous forest	361.98
1	DN 1A	Brasov - Cheia	313	Mixed forest	151.24
1	DN 1A	Brasov - Cheia	321	Natural grasslands	13.05
1	DN 1A	Brasov - Cheia	324	Transitional woodland-shrub	2.58
1	DN 1A	Brasov - Cheia	511	Water courses	37.24
1	DN 1A	Brasov - Cheia	512	Water bodies	78.48
2	DN 1	Brasov - Comarnic	111	Continuous urban fabric	154.60
2	DN 1	Brasov - Comarnic	112	Discontinuous urban fabric	1,206.57
2	DN 1	Brasov - Comarnic	121	Industrial or commercial units	320.43
2	DN 1	Brasov - Comarnic	141	Green urban areas	13.13
2	DN 1	Brasov - Comarnic	142	Sport and leisure facilities	18.24
2	DN 1	Brasov - Comarnic	211	Non-irrigated arable land	2.61
2	DN 1	Brasov - Comarnic	231	Pastures	108.78
2	DN 1	Brasov - Comarnic	242	Complex cultivation patterns	186.44
2	DN 1	Brasov - Comarnic	311	Broad-leaved forest	523.90
2	DN 1	Brasov - Comarnic	312	Coniferous forest	413.36
2	DN 1	Brasov - Comarnic	313	Mixed forest	1,201.87
2	DN 1	Brasov - Comarnic	321	Natural grasslands	11.20
2	DN 1	Brasov - Comarnic	324	Transitional woodland-shrub	28.69
2	DN 1	Brasov -	511	Water courses	76.4

		Comarnic			7
3	DN 1	Brasov - Persani	112	Discontinuous urban fabric	409.74
3	DN 1	Brasov - Persani	121	Industrial or commercial units	211.49
3	DN 1	Brasov - Persani	133	Construction sites	10.94
3	DN 1	Brasov - Persani	142	Sport and leisure facilities	16.82
3	DN 1	Brasov - Persani	211	Non-irrigated arable land	835.41
3	DN 1	Brasov - Persani	231	Pastures	982.97
3	DN 1	Brasov - Persani	242	Complex cultivation patterns	42.80
3	DN 1	Brasov - Persani	243	Land principally occupied by agriculture, with significant areas of natural vegetation	190.78
3	DN 1	Brasov - Persani	311	Broad-leaved forest	600.29
3	DN 1	Brasov - Persani	313	Mixed forest	53.73
3	DN 1	Brasov - Persani	324	Transitional woodland-shrub	45.10
4	DN 13	Brasov - Padurea Bogatii	111	Continuous urban fabric	89.72
4	DN 13	Brasov - Padurea Bogatii	112	Discontinuous urban fabric	555.63
4	DN 13	Brasov - Padurea Bogatii	121	Industrial or commercial units	310.55
4	DN 13	Brasov - Padurea Bogatii	131	Mineral extraction sites	50.62
4	DN 13	Brasov - Padurea Bogatii	141	Green urban areas	24.52
4	DN 13	Brasov - Padurea Bogatii	142	Sport and leisure facilities	8.36
4	DN 13	Brasov - Padurea Bogatii	211	Non-irrigated arable land	2,264.60
4	DN 13	Brasov - Padurea Bogatii	231	Pastures	478.64
4	DN 13	Brasov - Padurea Bogatii	242	Complex cultivation patterns	116.67
4	DN 13	Brasov - Padurea Bogatii	243	Land principally occupied by agriculture, with significant areas of natural vegetation	34.27
4	DN 13	Brasov - Padurea Bogatii	311	Broad-leaved forest	1,109.78
4	DN 13	Brasov - Padurea	312	Coniferous forest	14.06

		Bogatii			
4	DN 13	Brasov - Padurea Bogatii	313	Mixed forest	1.01
4	DN 13	Brasov - Padurea Bogatii	324	Transitional woodland-shrub	12.85
4	DN 13	Brasov - Padurea Bogatii	511	Water courses	16.61
4	DN 13	Brasov - Padurea Bogatii	512	Water bodies	73.69

Table 3. Surface of the habitat categories present in the 400 meters of both sides of the monitored road segments.

The length of the barriers that can't be overcome by bears vary from >500 m in the road segment Brasov - Vladeni E68, to 25,3 Km in the road segment Brasov - Comarnic DN 1. In the other two road segments the length of the barriers not overcome are respectively: 8,7 Km in the road segment DN 1 A - Cheia, and 1,6 Km in the road segment Padurea bogatii, DN13 (tab. 4).

Road code/nr.	**Length (m) of barriers that can't be overcome by bears**
Padurea bogatii, DN13	1592 m
Brasov - Comarnic DN 1	25352 m
DN 1 A - Cheia	8747 m
Brasov - Vladeni E68, DN1	<500 m

Table 4. Length of the barriers that cannot be overcome by the brown bears in the monitored road segments.

The distribution of the different classes of barriers in the monitored road segments is presented in fig. 2, 3 and 4.

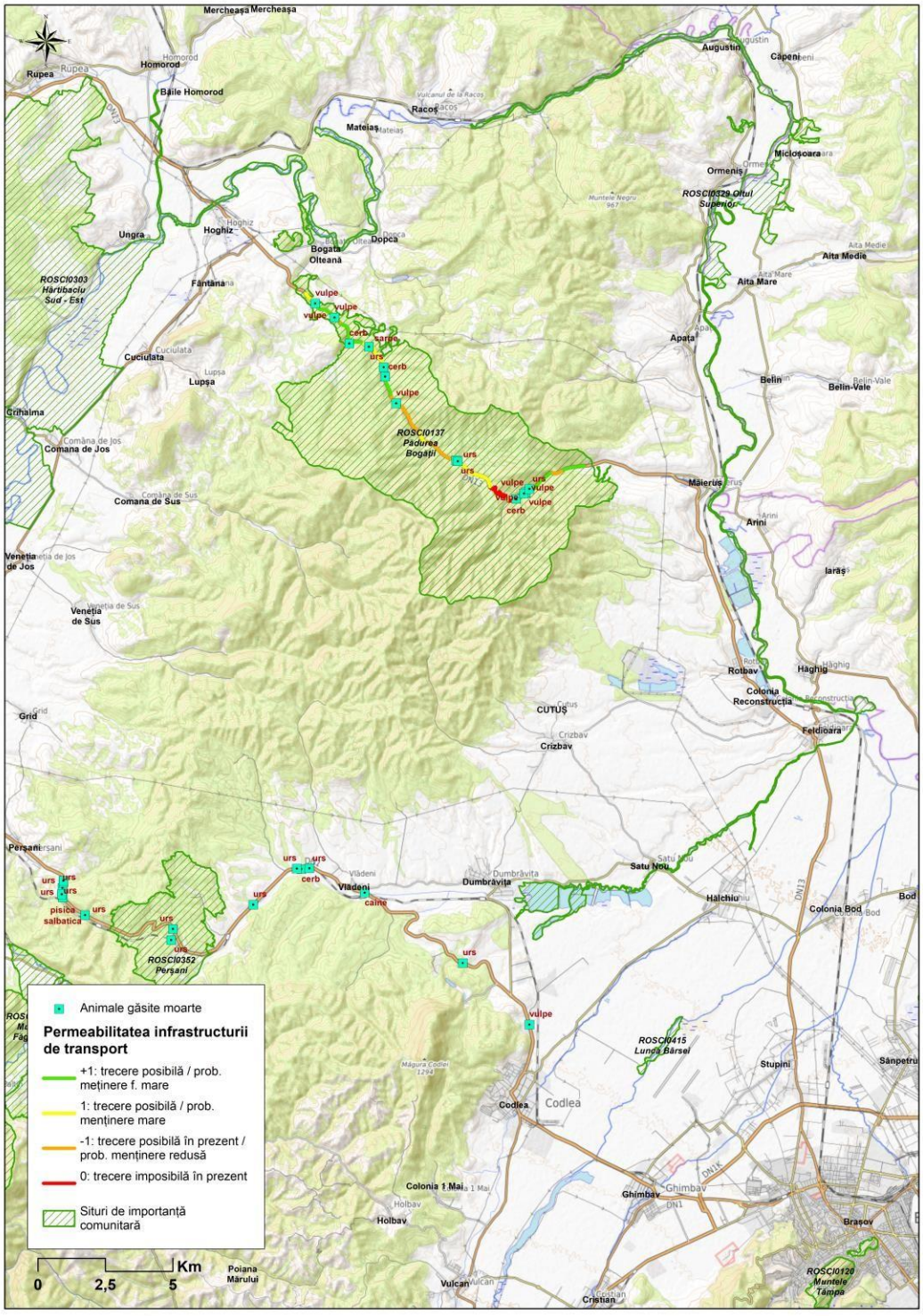

Figure 3. Distribution of the different classes of barriers along the monitored road segment Padurea Bogatii-Brasov DN 13.

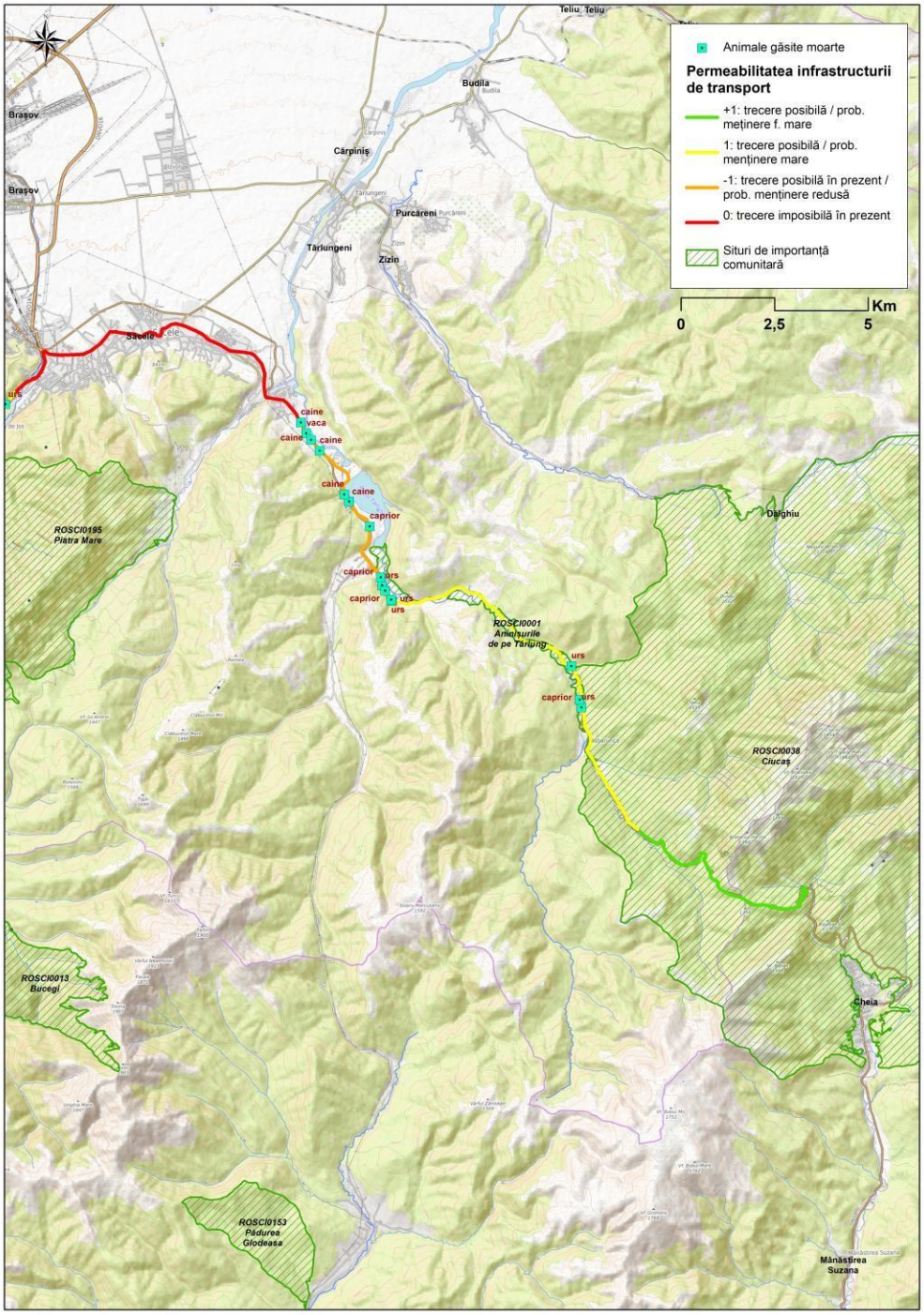

Figure 4. Distribution of the different classes of barriers along the monitored road segment Brasov-Cheia DN 1A.

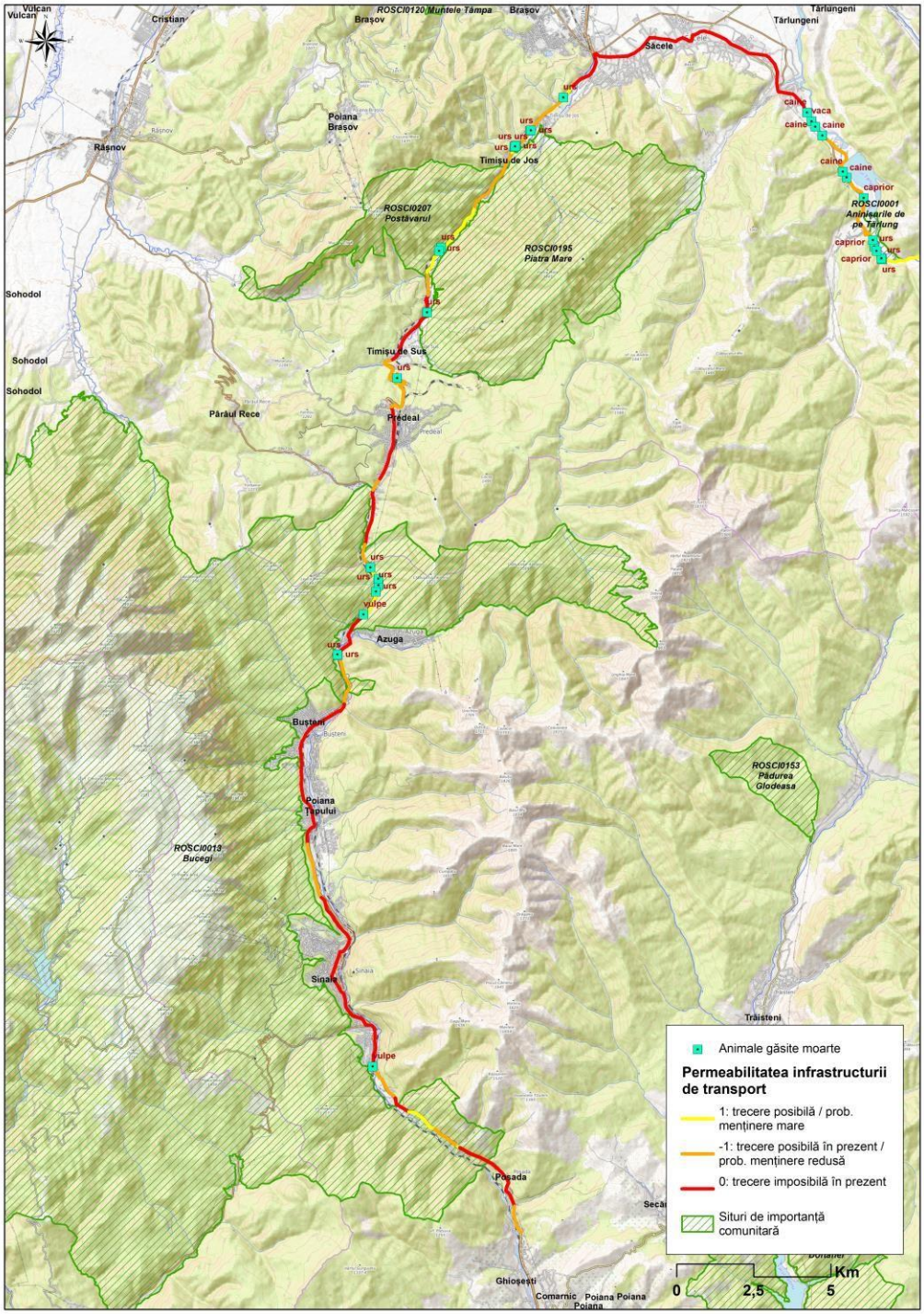

Figure 4. Distribution of the different classes of barriers along the monitored road segment Brasov-Comarnic DN1.

Monitoring road wildlife mortality

From January 2019 to September 2020 we carried out 144 monitoring sessions (table 5).

Road code/nr.	**Number of monitoring sessions**
Padurea bogatii, DN13	36
Brasov - Comarnic DN 1	36
DN 1 A - Cheia	36
Brasov - Vladeni E68, DN1	36

Table 5. Number of monitoring sessions carried out in the selected road segments.

During the systematic sampling we recorded 27 dead animals, including 8 dogs and 1 cow. Overall we identified 5 different wildlife species: fox, badger, red deer, roe deer and bear. Considering only the wildlife specie the 44% of the animals were found in the road segment Padurea bogatii, DN13, the 22% in DN 1 A – Cheia, and in Brasov - Vladeni E68, DN1, and the remaining 11% in the Brasov - Comarnic DN 1. The 2 bears found dead were both in the road segment Brasov - Comarnic DN 1 (table 6).

Road code/nr.	Animals found dead
Padurea bogatii, DN13	5 foxes, 3 red deer
Brasov - Comarnic DN 1	2 bears
DN 1 A - Cheia	4 dogs, 1 cow, 4 roe deer
Brasov - Vladeni E68, DN1	4 dogs, 3 foxes, 1 badger

Table 6. Animals found dead in the monitored road segments.

Monitoring of crossing points

In order to monitor the crossing points used by the different wildlife species 20 camera traps were installed in 2 of the 4 selected road segments, 6 camera traps were installed in the segment Padurea bogatii, DN13, while 14 in the segment Brasov - Comarnic DN 1. Considering the high risk of theft of the camera traps we mainly carried out the activity trough specific snow-tracking sessions.

Overall in the snow-tracking sessions carried out in the two winter seasons we identified 1486 crossing points of 12 different species. 79,7% of the crossing points were identified in the road segment Brasov - Comarnic DN 1, 12,6% in the road segment DN 1 A – Cheia, and the remaining 7,7% in the road segment Padurea bogatii, DN13 (table 7).

In the monitored road segments we recorded 273 bear's crossing points, the majority of which were found in the road segment Brasov - Comarnic DN 1 (85%), the rest in the road segment DN 1 A – Cheia (10%) and in the road segment Padurea bogatii, DN13 (5%).

.

Road segment	N. crossing point
DN 1	**1185**
Brown bear	233
Fox	56
hermelina	1
Lynx	27
Otter	1
Pine marten	16
Rabbit	3
Red deer	320
Roe deer	165
Wild boar	325
Wild cat	8
Wolf	30
DN 1 A	**187**
Brown bear	27
Fox	10
Lynx	4
Red deer	77
Roe deer	25
Wild boar	35
Wild cat	5
Wolf	4
DN 13	**114**
Brown bear	13
Red deer	29
Roe deer	29
Wild boar	39
Wolf	4
Grand Total	**1486**

Table 7. Crossing points recorded in the snow-tracking sessions in the selected road segments.

Monitoring traffic volume

The monitoring sessions started in June 2019 in the road segment Brasov - Vladeni E68, DN1, while in the remaining road segment the monitoring sessions started in 2020 (table 8, and figure 5).

Road code	**Starting monitoring date**
Padurea bogatii, DN13	27.05.2020
Brasov - Comarnic DN 1	29.04.2020
DN 1 A - Cheia	27.01.2020
Brasov - Vladeni E68, DN1	17.06.2019

Table 8. Monitoring sessions of traffic volume in the selected road segments.

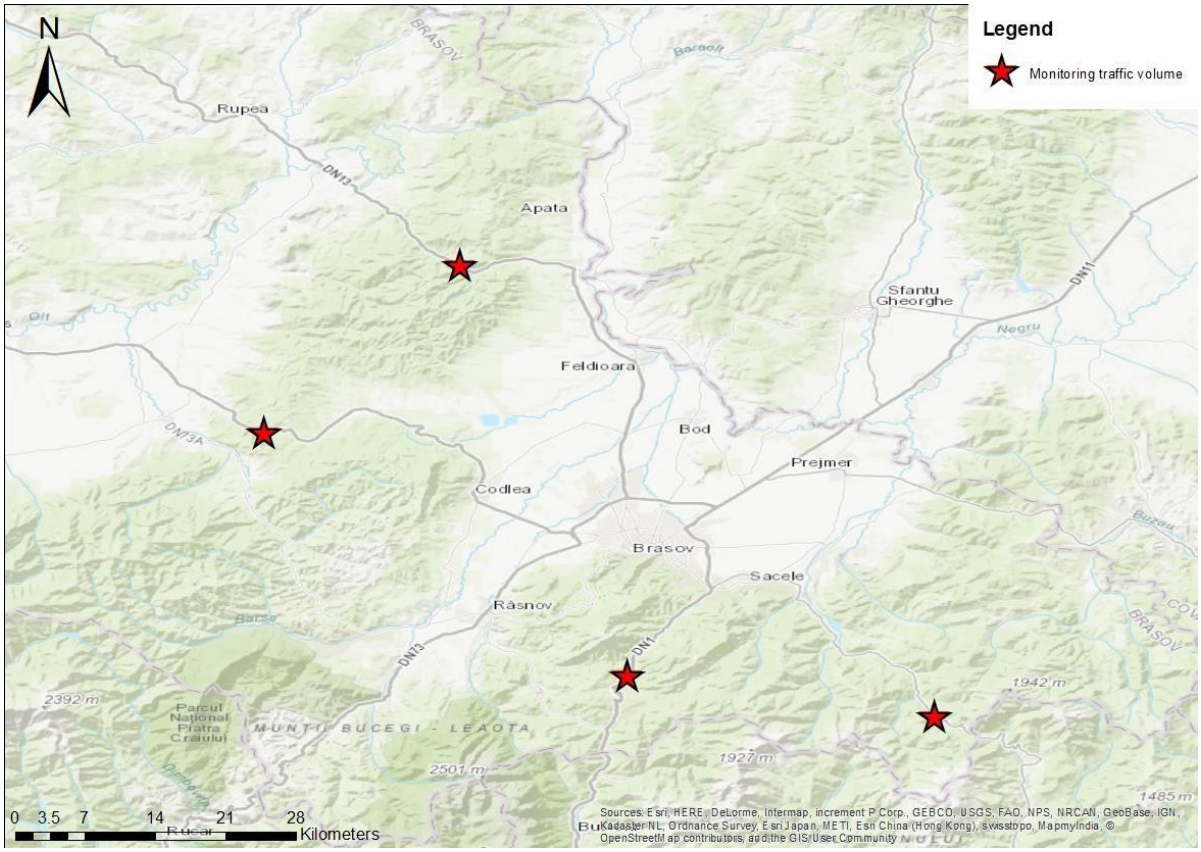

Figure 5. Sites of installations of the devices to monitor traffic volume.

The average daily traffic varied from 1669 vehicles in the road segment DN 1 A – Cheia, to 13993 vehicles in the road segment Brasov - Comarnic DN 1. The hourly peak of traffic was recorded between 1.00 p.m in the road segment DN 1 A – Cheia

(138 vehicles), and 5.00 p.m. in the road segment Brasov - Comarnic DN 1 (663 vehicles). In the 4 monitored segments the distribution of traffic didn't show a significant difference between the weekend and the working days, and we recorded a significant reduction in the number of vehicles during the night, except in the road segment DN1 Brasov – Comarnic DN 1, because on DN1 the passage of big trucks is not allowed during the daytime. The details of traffic volume data are presented in the figures 6,7 and 8.

All the data is explained in the graphs below (monthly average, week average, and total per year). The missing data in the graphs are related to the failure of the batteries.

In the evaluation of the results it's important to take in account the restrictions occurred due to Covid-19 from March to May 2020.

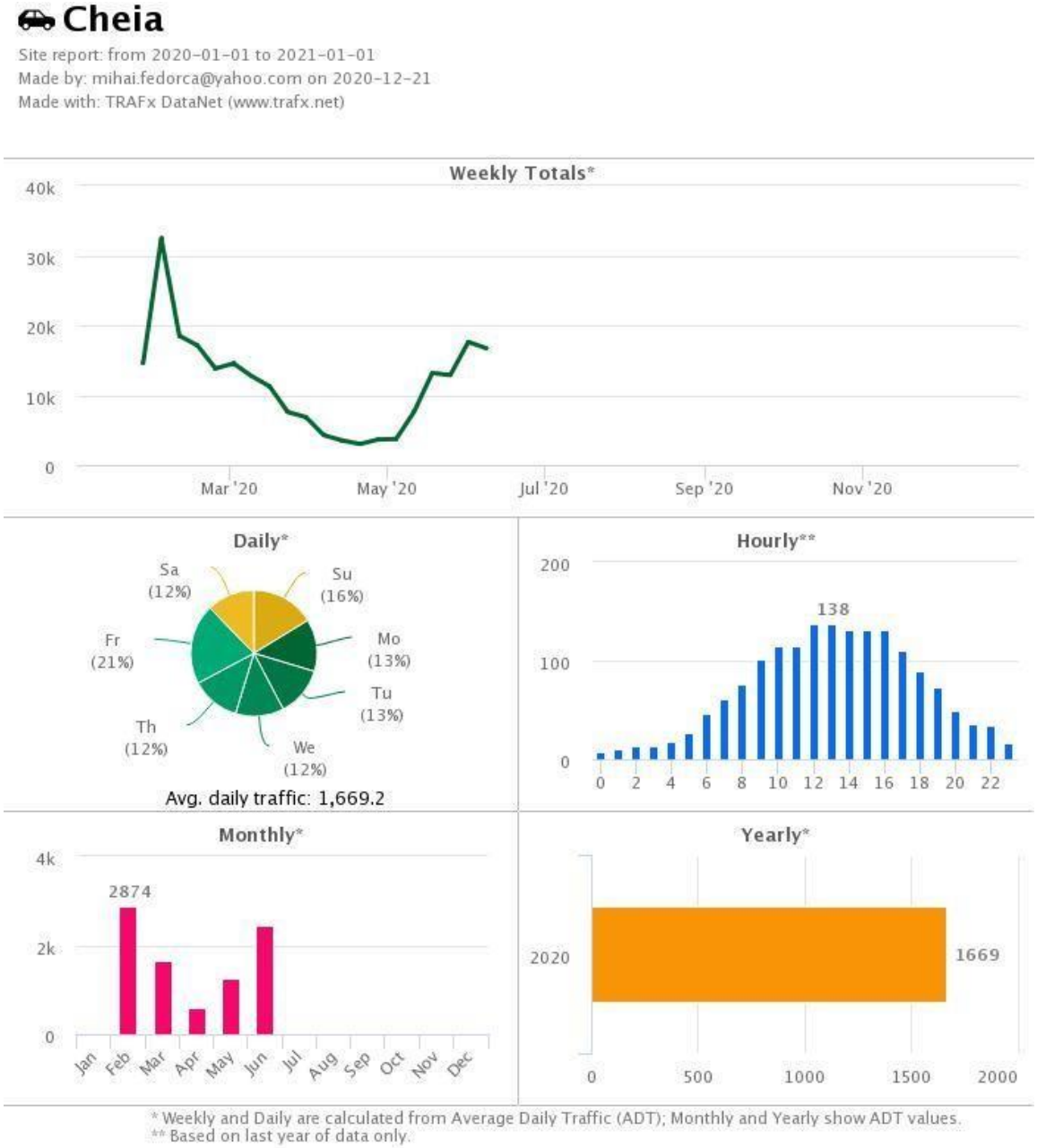

Figure 6. Traffic volume data of the road segment DN 1 A – Cheia.

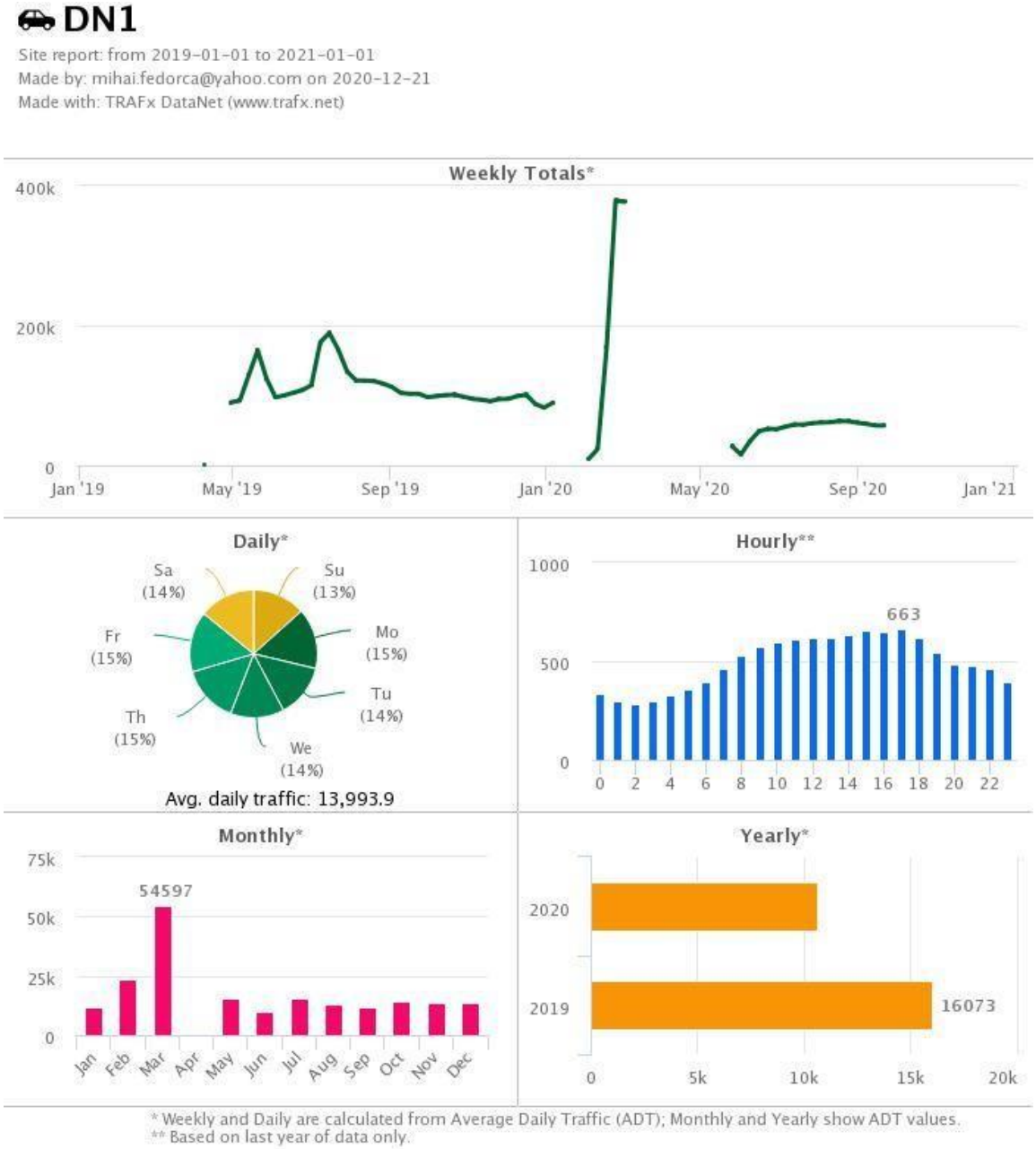

Figure 7. Traffic volume data of the road segment Brasov - Comarnic DN 1.

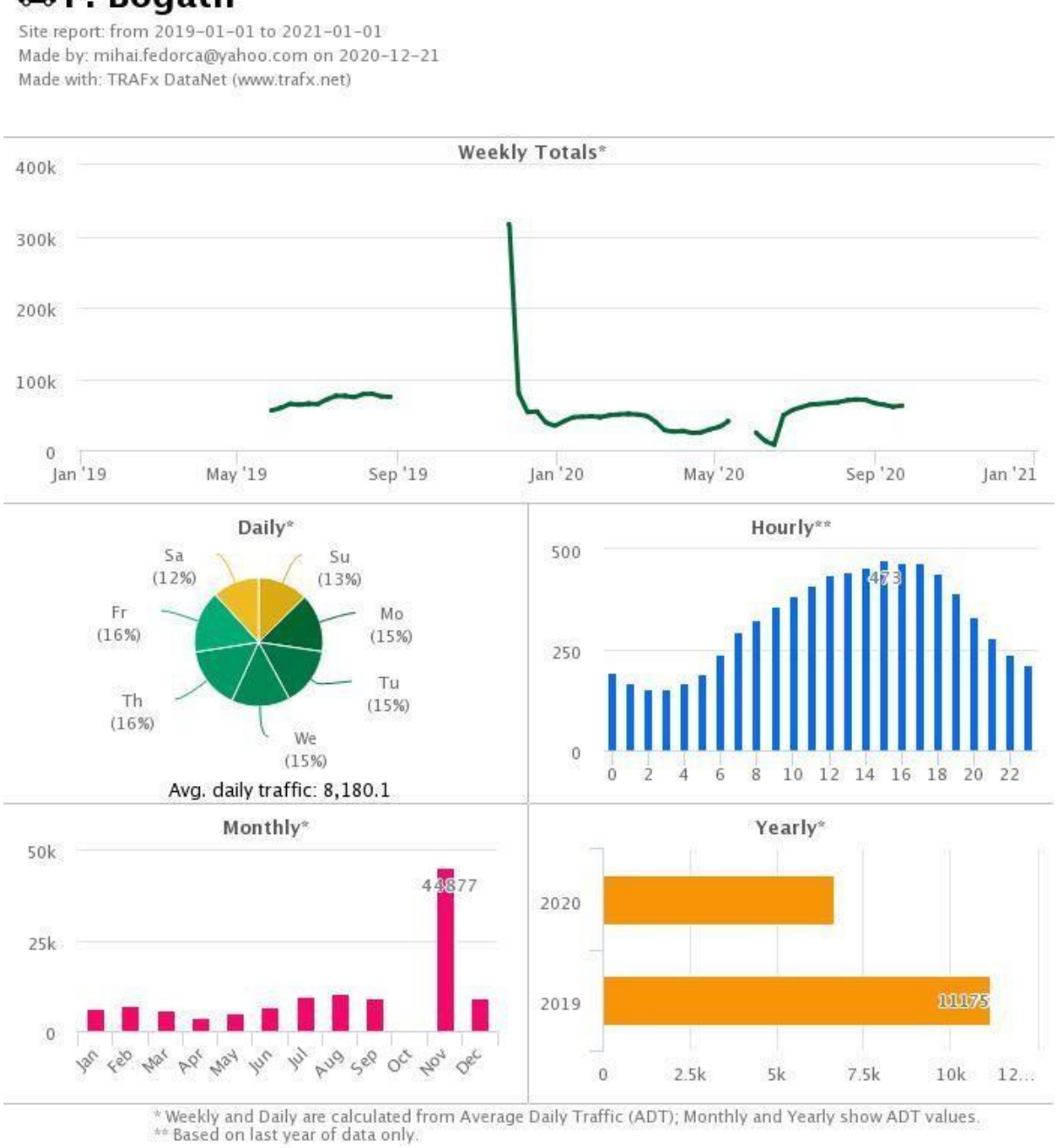

Figure 8. Traffic volume data of the road segment Padurea bogatii, DN13

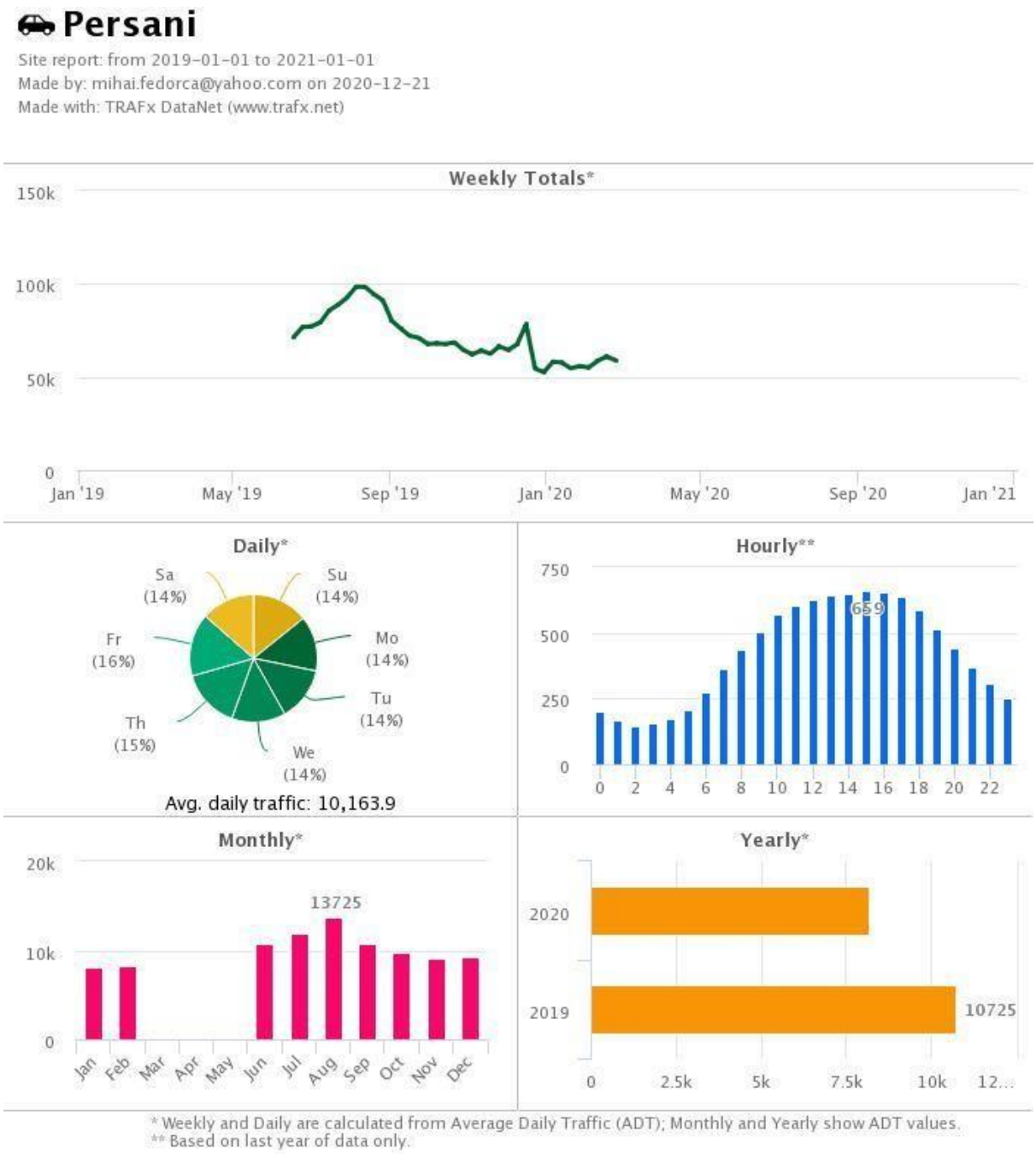

Figure 9. Traffic volume data of the road segment Brasov - Vladeni E68, DN1

FINAL CONSIDERATIONS

The monitoring activities were carried out as was planned in the project proposal. We were able to monitor 33 Km more than was originally foreseen

The restrictions due to Covid didn't affect, in a significant way, the implementation of the action. We encountered some problems due to the limitations in the use of camera traps along the roads, but we monitored the crossing points trough snow-tracking sessions, then we were able to record the necessary information in a more complete and detailed way because we surveyed the whole length of each road segment.

All the results obtained, including also the results of Action A3, allowed us to identify the 6 sites for the installation of the AVC PS: 2 will be installed in the Padurea bogatii, DN13 road segment, 2 in the DN1 A Cheia road segment, 1 in Brasov - Vladeni E68, DN1 road segment and the last one in the DN1 Brasov Comarnic road segment (figure 10.)

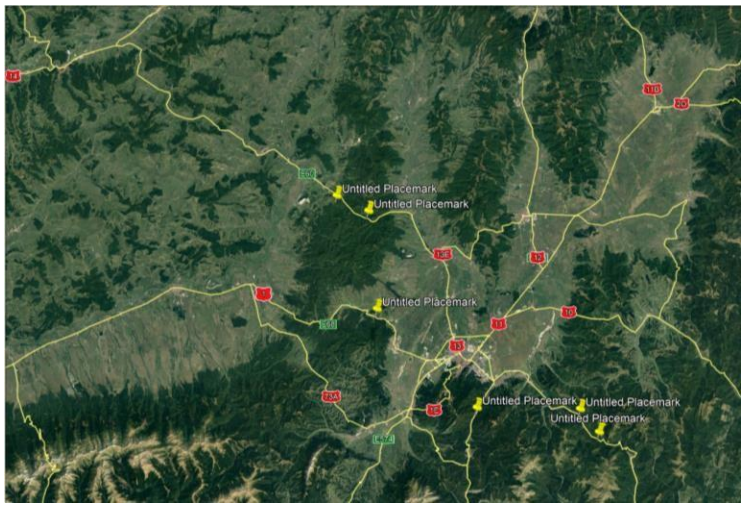

Figure 10. Sites identified for the installation of the AVC PS foreseen in Action C1.

In July we already installed the first 2 km of the virtual fence in the DN1, and the remaining Km will be installed in the Padurea Bogatii road.

ANNEX 1.

Criteria used to define the different categories of barriers to estimate the permeability of the road to bear's movements (in Romanian).

1.1.1. Metodologie

Pentru analiza permeabilității sectoarelor de drum, au fost luați în calcul trei factori:

- posibilitatea fizică a traversării sectorului respectiv,
- "costul" traversării zonelor adiacente ,
- estimarea evoluţiei în timp a caracteristicilor care pot influenţa gradul de permeabilitate.

Factorii sunt analizați prin evaluarea a șase parametrii direct în teren. Practic se parcurge tronsonul care urmează a fi analizat și la fiecare schimbare de condiții care influențează permeabilitatea se marchează (ID/GPS) punctul și se notează în fișă indicele aferent parametrului.

Parametrii analizați:

A. CFR - caracteristicile constructive ale căilor ferate (parapeţi, ziduri, taluzurilor, etc.)

0- Nu exista,

1- CFR fara taluz si/sau fara parapeti sau cu parapet si taluz mai mic de 1,5 m

2- CFR cu taluz sau parapet 1,5-2m existent sau CFR marginit de un drum national/European la distante cuprinse intre 50-200m

3 CFR marginit de un drum national/european sub 50 m distanta sau/și marginit de taluz și/sau parapet existent 2-3m inaltime

4- CFR marginite de garduri, case sau alte constructii rasfirate, raportate la un sector de 200 m lungime

5- CFR marginite de garduri, case sau alte constructii in forma continua, raportat la un sector de 200 m lungime și/sau parapet si/sau taluz mai inalte de 3 m.

B. Drumuri rutiere –DR- caracteristicile constructive ale drumurilor (parapeţi, ziduri, taluze, etc.)

0 – drum forestier fara parapeti si taluz > 1,5m si fara garduri, case sau alte constructii

1 – drum national fara parapeti si taluz > 1,5m si fara garduri și fara case sau alte constructii

2 – drum national fara taluze și parapeti sau cu taluze si parapeti mai mici de 1,5 m inaltime, cu case sau alte constructii rasfirate fara garduri intre ele

3 – drum forestier si drum national cu parapeti si taluz cu inaltime 1,5-3m

4 – drum forestier si drum national marginit de garduri, case sau alte constructii rasfirate raportate la un sector de 200 m lungime

5- drum forestier si drum national marginit de garduri, case sau alte constructii in forma continua raportate la un sector de 200 m lungime practice impermeabile sau sau parapet si taluze mai mari de 3 m

C. Reteaua hidrologica - RH

0 – neexistenta in paralel cu drumul la o distanta mai mica de 50 m

1 – rauri mici paralele cu drumul fara indiguiri sau alte constructii speciale cu distate de minim 50 m intre drum si rau

2 – rauri mari paralele cu drumul fara indiguiri sau alte constructii speciale minim 50 m intre drum si rau

3 - rauri mici sau mari, paralele cu drumul, ce prezinta indiguiri sau maluri consolidate cu inaltime mai mare de 1,5m sau alte constructii speciale cu distate mai mici de 50 m intre drum si rau, dar un legate intre ele

4 - rauri mici sau mari, paralele cu drumul, ce prezinta indiguiri sau maluri consolidate cu inaltime mai mare de 1,5m sau alte constructii speciale cu distate mai mici de 50 m intre drum si rau, legate intre ele.

5 - rauri mici sau mari, paralele cu drumul si cu calea ferata, ce prezinta indiguiri sau alte constructii speciale cu distate mai mici 50 m intre drum si rau si/sau legate intre ele.

D. Zone construite- ZC- caracteristicile constructive a zonelor construite din imediata vecinătate a potențialelor zone de trecere a carnivorelor mari, la distata cuprinsa intre 50- 200 m lungime (localităţi compacte, zone industriale, perimetre îngrădite, etc.).

0 – fara zone construite

1 – zone construite rasfirate fara garduri intre constructii

2 – zone construite rasfirate cu garduri intre constructii

3 – perimetre ingradite fara constructii cu gard impermeabil (mai inalt de 2 m, din beton, metal sau plasa de sarma

4 – zone construite compacte fara garduri intre constructii mai inalte de 2 metrii intre constructii

5 – zone construite compacte garduri intre constructii mai inalte de 2 metrii intre constructii, practic impermeabile

E. Gradul de acoperire a zonelor limitrofe – GA- cu habitate naturale caracterizate de un grad diferit de favorizare a deplasării (păduri compacte, trupuri de pădure, pășuni împădurite, terenuri agricole, etc),

0 – pădure compacta pe ambele părți începând de la rețeau de transport (1-10m) luată în monitorizare

1 - padure compacta doar pe o parte a rețelei de transport, ce începe din vecinătatea rețelei de transport (1-10 m) distanță față de rețeau de transport luată în monitorizare

2 – pădure compacta pe ambele părți sau pe o parte, începând de la o distanță de 10 metri față de rețeau de transport luată în monitorizare, iar porțiunea între rețeau de transport și pădure este lipsită de vegetație înaltă (sub 1,5 m înălțime) sau pădure compactă (vegetație mai înaltă de 1,5 m) cu lățimea mai mare de 10m cuprinsă între rețele de transport sau între rețeau de transport și râu sau alte combinații asemănătoare.

3 – trupuri de padure intrepatrunse cu terenuri agricole pe o bandă de minim 50 m de la rețeau de transport,

4 – terenuri agricole sau terenuri fara vegetatie pe o distanță de minim 50 m față de rețeau de transport luată în monitorizare

5 - terenuri agricole sau terenuri fara vegetatie intrepatrunse cu zone construite sau zone industriale (cariere, balastiere, fabrici, etc.) pe toate sectoarele cuprinse între 1-200 m față de rețeau de transport luată în monitorizare.

F. Identificarea proiectelor mari de infrastructură – PI- la nivel național

0- nu sunt proiecte in zona

1- Sunt proiecte propuse doar in strategii fara sa se cunoasca perioada de demarare
2- Sunt proiecte aprobate si neincepute de infrastructura carea ar putea afecta miscarea animalelor aprobate si neincepute (autostrada, zone industriale, etc.)
3- Sunt proiecte aprobate si demarate
4- Sunt proiecte demarate si stadiu de executie
5- Sunt proiecte in stadii finale de executie fara sa aiba prevazute masuri speciale pentru mentinerea conectivitatii

Analiza parametriilor se face la nivel de tronson de lungime drumuri principale și 200 m în profunzimea habitatului, pe ambele părți ale drumului. Sectoarele de determină în funcție de schimbarea parametriilor monitorizați, astfel că un sector de permeabilitate poate să aibă lungimi variabile în funcție de locația de început și sfârșit barieră antropică.

Sunt zone foarte mici, cuprinse între 1-50m lățime, pe unde se consideră a fi singura soluție de trecre a animalelor, unde nu se cumulează factorii de permeabilitate ci se ia ca atare.

În funcție de barierele identificate în teren pe sectoarele analizate se face clasificarea permeabilității habitatelor în patru clase:

Clasa permeabilitate	**Valoare cumulate factor permeabilitate** **A+B+C+D+E+F**	**Excepție de la punctajul cumulat**	**Descriere clasa permeabilitate**
2	Fără punctaj	Punctual în zone foarte mici car ar putea fi folosite de către animale ca ultimă șansă de trecere. Zone cuprinse între 1-50m lățime	Porțiuni pe sub poduri, viaducte, grădini fără garduri solide, porțiuni neângrădite între case, etc.

+1	0-6	Fără să fie vre-un factor cu valoare de 3,4,5 pe sectoarele 1-100 si 101-500	Sectoare prin care trecerea este posibilă în prezent / costul deplasării este redus / probabilitatea menţinerii permeabilităţii este foarte mare;
1:	7-14	Fara sa fie vre-un factor cu valoarea 4,5 pe toate tronsoanele sau Fara sa fie vre-un factor cu valoarea 4 pe sectoarele 1-100 si 101-500	Sectoare prin care trecerea este posibilă în prezent / costul deplasării este mediu-redus / probabilitatea menţinerii permeabilităţii este mare;
-1:	15-20	Fara sa fie vre-un factor cu valoarea 5 pe sectoarele 1-100 si 101-500	Sectoare prin care trecerea este posibilă în prezent / costul deplasării este mediu / probabilitatea menţinerii permeabilităţii este redusă;
0:	21-30	Dacă un sau mai mulți factori au valoarea 5	Sectoare prin care trecerea animalelor este practic imposibilă / costul traversării este extrem de mare/ probabilitatea ameliorării permeabilităţii este redusă;

Pentru estimarea posibilităţii fizice a traversării **(A,B,C,D)**au fost luate în considerare caracteristicile constructive ale căilor de comunicare (parapeţi, panta taluzurilor, ziduri, diguri etc.) şi ale zonelor construite din imediata vecinătate (localităţi compacte, zone industriale, perimetre îngrădite), precum și proximitatea față de un curs de râu împreună cu unele amenajări efectuate pe acesta (dig, barj, zid, etc.)

Pentru evaluarea costului deplasării (E, A+B+C+D) au fost luate în considerare gradul de acoperire a zonelor limitrofe cu habitate caracterizate de un grad diferit de favorizare a deplasării (păduri compacte, trupuri de pădure, păşuni împădurite, terenuri agricole, etc) şi efectul cumulativ al altor lucrări de infrastructură din vecinătate (căi ferate, alte drumuri), al zonelor antropizate (localităţi, dezvoltări industriale, cariere, balastiere) şi elemente naturale cu permeabilitate redusă (râuri mari, chei, canioane, văi abrupte etc).

Probabilitatea menţinerii favorabilităţii **(E+F)** a fost estimată în faza de teren prin caracteristicile peisajului, tipurilor de habitat şi apropierea de zonele de dezvoltare iar la faza de birou se va lua în considerare proiectele de dezvoltare și infrastructură, propuse, aprobate sau în faza de execuție.

Pentru estimarea posibilităţii fizice a traversării punctuale a unor bariere (drumuri, căi ferate, râuri, zone construite, etc.), nu se iau în calcul parametrii A-F ci se face o descriere sumară a fiecărui sector cu lungime de 1-50m lungime.