Batumi Raptor Count: from migration counts to conservation in a raptor flyway under threat

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Abstract Since 2008, the Batumi Raptor Count project has monitored the autumn migration of raptors at Batumi, on the eastern shore of the Black Sea in southwest Georgia. What started as an expedition by young birders has become an invaluable project for monitoring raptor populations in the little-studied east African–Palearctic flyway. Autumn raptor migration through the Batumi bottleneck is notable for globally important concentrations of Honey-buzzards *Pernis apivorus*, Montagu's *Circus pygargus*, Pallid *C. macrourus* and Marsh Harriers *C. aeruginosus* and accounts for at least 1% of the global breeding population of ten raptor species. By stimulating migration-based ecotourism, the project has had a significant economic impact on the communities where the count stations are located, which has increased societal and political support to reduce the widespread illegal raptor shooting in the region; it has also developed an important educational role for schoolchildren and older students. This paper summarises the 12-year history of the Batumi Raptor Count, and provides a detailed description of a typical autumn migration season. The project aims to expand its education and conservation remit while continuing to monitor one of the world's biggest raptor migration bottlenecks.

Introduction

They were bewildering times when we ran the first Batumi Raptor Count along the eastern shore of the Black Sea in south-western Georgia in 2008. The European Commission cancelled our funding because an armed conflict plagued this former Soviet country; commuting to the count stations proved to be a daily battle against the elements and poor infrastructure; and bird-watching and ecotourism were still alien concepts to most Georgians. Starting a long-term raptor migration monitoring project at Batumi may have been an act of youthful naivety and ambition but, when our first full-season count of more than 800,000 raptors was made public, along with our reports of widespread illegal raptor shooting in the region, the response of birders, conservationists and the scientific community was overwhelming. Now, more than a decade later, the Batumi Raptor Count has devel-

oped into one of the world's largest migration watch-sites, attracting more than 60 citizen scientists and hundreds of international visitors every autumn, and working with local communities, conservationists, the education sector and government bodies towards sustainable use and adequate protection of migrating raptors.

Supporting our migration counts and the local ecotourism sector is one of the most effective ways that birders can help to bring about a more sustainable future for birds *and* people in this globally important migration flyway. Surprisingly, perhaps, the British birding community still accounts for only a small proportion of participants in the Batumi Raptor Count project and visitors to the count stations. Needless to say, when *BB* invited us to chronicle the history of the Batumi Raptor Count project for the British birding community, we jumped at the opportunity.

Rediscovery of a forgotten flyway

The massive aggregation of migrant raptors along the eastern Black Sea flyway was described as early as the nineteenth century (Villkonskii 1897). However, it was not until the mid 1970s that ornithologist Alexander Abuladze organised systematic counts at migration hotspots throughout Georgia, revealing that raptor passage along the Black Sea coast numbered in the hundreds of thousands (Abuladze 1994, 2013; fig. 1). Also in the 1970s, a British team surveyed raptor migration in northeast Turkey, which indicated that migration occurs along a broader front there (Andrews *et al.* 1977). Despite these reports and more recent studies of traditional migration-based falconry in the region (Magnin 1989; van Maanen *et al.* 2001), the Black Sea coast of Georgia continued to be something of a blind spot for the international birding community.

In 2007, when the Flemish biology students Brecht Verhelst and Johannes Jansen were preparing for a birding trip through the Caucasus, it was these old studies that led them to prospect for raptor migration just north of the seaside town of Batumi. There, the Lesser Caucasus meets the eastern Black Sea coast to form a narrow coastal strip that acts as a bottleneck for the flow of migrant birds coming in from the north (fig. 1). Using the foothills of the Lesser Caucasus as a vantage point, in just a few days Brecht and Johannes observed tens of thousands of Honey-buzzards *Pernis apivorus* making their way south. Their observations suggested that even the largest historical counts in the region underestimated the true volume of raptor migration. The idea of a full-season count was born, and shortly afterwards preparations for the first Batumi Raptor Count (BRC) were under way.

A plan was hatched to conduct a two-month raptor migration survey with international volunteers, mostly students, in 2008 and 2009. From the outset, the idea was to engage biology students from Georgia and neighbouring countries in the counts as well. It was effectively an international youth exchange, for which funding was secured from the EU's 'Youth in Action' (now Erasmus+) programme. The armed escalation of political conflict between Georgia and Russia in the summer of 2008 threatened to derail the project before it had even started, and the EU funding was withdrawn. Yet the promise of life-changing adventure and mind-boggling numbers of raptors was too strong to resist for the young birders that had been mobilised already. It was decided that the count should take place regardless, even with limited resources, and so in the autumn of 2008 a small army of birders – Belgian, Dutch, Swedish, Georgian, Armenian and others – descended upon Batumi.

It did not take long before the pilot counts exceeded even our wildest expectations. The numbers of raptors passing through the eastern Black Sea flyway were indeed much larger than previously estimated. By the end of that first season, we had recorded four times the numbers counted by Andrews *et al.* (1977) in northeast Turkey! Finding volunteers for a second count season was not difficult, and the Black Sea flyway was soon on the radar of bird migration enthusiasts worldwide.

Besides the remarkably diverse palette of birds, featuring more than 30 species of diurnal raptors each year, the autumn raptor migration through the Batumi bottleneck stands out for globally important concentrations of Honey-buzzards, Montagu's *Circus pygargus*, Pallid *C. macrourus* and Marsh

Christian Gelpke

240. Honey-buzzards *Pernis apivorus* can darken the skies for hours on end at Batumi; 28th August 2011.

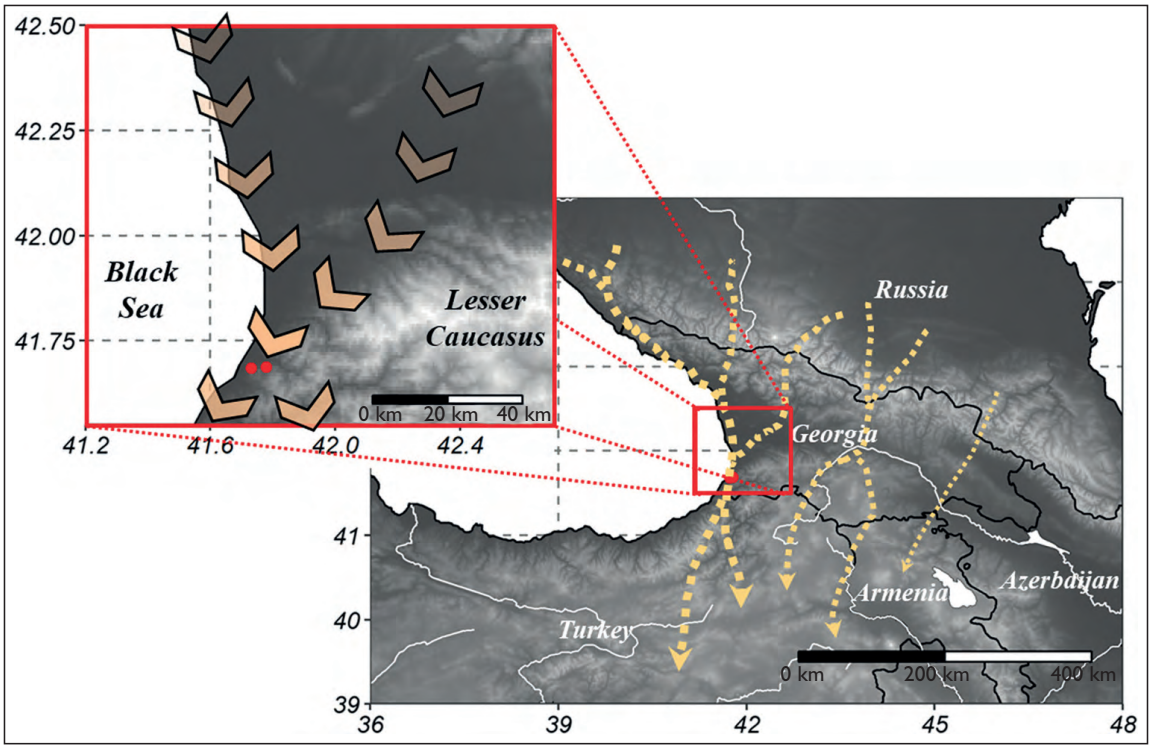

Fig. 1. The Batumi bottleneck is situated in the westernmost trans-Caucasian migration corridor for soaring birds, and concentrates much larger numbers of migrants than the more inland routes (main map, after Abuladze 2013). At Batumi Raptor Count, volunteer observers monitor the migration from two hilltop count stations (inset, red dots) located roughly 2 km and 6 km from the coast, in the foothills of the Lesser Caucasus. The eastern Black Sea flyway reaches its narrowest point here, while south of Batumi city the flyway splits into a coastal and more inland route, resulting in less concentrated passage through northeast Turkey (cf. Andrews *et al.* 1977).

Harriers *C. aeruginosus*. Moreover, the pilot counts indicated that migration counts could be a cost-effective way to contribute to monitoring the populations of these and other raptors migrating between eastern Africa and the Palearctic. The migratory passage at Batumi appeared to account for at least 1% of the global breeding population of ten raptor species (Verhelst *et al.* 2011), and it would be difficult to monitor the vast Russian raptor populations by other means.

Raptor shooting: a bottleneck for conservation?

Along with the rediscovery of Batumi's raptor migration spectacle, the BRC project brought a more sinister issue to the attention of birders and conservationists: illegal but rampant and widespread hunting of migrant raptors (and other birds). Although a team of Georgian and Dutch researchers had investigated the conservation impact of traditional, migration-based falconry in Georgia in the early 2000s (van Maanen *et al.* 2001), the scale of illegal raptor killing in Georgia remained largely unknown until 2008.

It was impossible not to notice the illegal hunting during our first counts. Looking for the best possible vantage points for migration counts, we ended up in prime shooting locations. In hindsight, it is perhaps surprising that the hunters did not take issue with this. However, Georgian hospitality is legendary for a reason, and our unannounced presence piqued the hunters' curiosity. Many hunters would happily show us their quarry as they passed by our count stations, or casually fire into a flock of European Bee-eaters *Merops apiaster* while chatting with one of the counters. Heart-wrenching as those experiences could be, it was intuitively clear that aggressive confrontation with the hunters was not going to help the birds in the long run. Instead, we tried to better understand the hunters; and before long BRC volunteers found themselves discussing raptor ecology with ardent shooters.

As you watch the vast streams of buzzards, kites and eagles passing by, it is easy to imagine how local hunters might see raptors as an endless resource, rather than as vulnerable species worthy of protection. From the hunters we learnt that many of the raptors shot (especially Honey-buzzards) were eaten and that, unlike shooters in Malta and Lebanon, Georgians do not shoot raptors in spring, despite strong passage in that season. The more we learnt, the more we realised that the shooting was much more than just a bad habit of some malicious individuals, and that we needed to better understand the hunters' motivations to find pragmatic solutions.

Migration counts as a catalyst for conservation

It quickly dawned on the BRC founders that a long-term raptor migration count would not only be useful for monitoring raptor populations but could potentially also be a catalyst for raptor conservation. Moreover, for the migration counts to have a sustainable future, we felt that the project would eventually need strong Georgian leadership. To that end, environmental students from Georgia, Turkey and Armenia were engaged in the counts from the beginning. Thanks to the EU's 'Youth in Action' programme, dozens of regional students took part in our international exchanges, learning to design and conduct ecological research, or developing environmental education materials and activities in local primary schools. Unfortunately, as we are a mostly volunteer-based organisation, and volunteering is a luxury that few Georgians can afford, it has proven extremely difficult to bind talented students to the BRC project long term. However, BRC internships did help several of our former students to secure a job in the regional conservation sector, and in 2020 we employed a former trainee to help coordinate a pilot spring migration count.

Another crucial component of our non-confrontational and community-based conservation strategy has been the development of a flourishing ecotourism sector in our host communities of Sakhalvasho and Shuamta. As with our education activities, the creation of ecotourism infrastructure was a logical consequence of the migration counts, since the demand from international birders soon outgrew our volunteer capacity. By developing a network of guesthouses near the count stations, many local families have benefited from the international interest in the Batumi raptor migration. More than any

other activity of the BRC, the economic stimulus of ecotourism has had a profound impact on illegal shooting activity in these communities: live birds are now more valuable than dead ones to many local people. The homestay model also allows local people to better appreciate the exceptional nature of the migration spectacle, its appeal to birders, and the value of nature and wildlife in general.

In short, the essence of the BRC conservation philosophy is to help birds by helping people.

Simon Cavailles

Johannes Jansen

241 & 242. Since the start of the BRC project, the promotion of ecotourism has been an important aspect, with the aim of showing local families another 'value' of raptor migration besides shooting birds; 19th August 2013 (above). The development of a new, permanent count station by the regional governments in 2019 shows the progress made in this respect and the local support for the project; 30th August 2019 (below).

Monitoring one million raptors

Based on the experience gained during the pilot counts of 2008 and 2009, we developed a protocol for long-term, systematic raptor migration monitoring. Importantly, we decided to focus on the collection of high-quality data for seven priority species with a globally important passage at Batumi (Verhelst *et al.* 2011; table 1). The sheer volume of raptor migration at Batumi simply does not permit us to count all species equally well. By focusing our efforts, we can not only identify, but also age and sex a higher proportion of individuals, providing information on species' demography as well as abundance. We also fine-tuned our count strategies between species to obtain the best possible data under local conditions. Restricting the set of target species also increases the likelihood that the count effort can be maintained long term.

It took another full year after the pilot counts to fine-tune the protocol. Since 2011, however, when the BRC moved its headquarters up the mountain to the community of Sakhalvasho, we have been able to maintain a high and consistent count effort for all target species. Perhaps the most important guideline for novice counters is that we prioritise the reliability and accuracy of species identification in our records. For example, when in doubt between a Montagu's or a Pallid Harrier, the bird should be recorded as 'MonPal'. With the intense passage at Batumi, such 'UFOs' account for 40–50% of all ringtail harriers and large eagles. However, we can generate estimates of daily and annual species totals from these counts of unidentified birds by extrapolating the proportion of each species among the birds that were identified reliably (Wehrmann *et al.* 2019; Vansteelant *et al.* 2020).

In addition to raptors, we record numbers of Turtle Dove *Streptopelia turtur*, Common Crane *Grus grus*, Black *Ciconia nigra* and White Storks *C. ciconia* and European Roller *Coracias garrulus* (table 2). Counting these species requires little additional effort, while the data may help to monitor their precarious conservation status in the east African–Palearctic migration system. By contrast, most of the smaller raptor species are very difficult to count because they typically pass through singly

and low above the ground or the forest canopy, especially under cloudy conditions, and will often circle around the counting stations, hunting passerines or insects (e.g. Eurasian Sparrowhawk *Accipiter nisus* and Hobby *Falco subbuteo*).

Two count stations are used to cover all flight paths of raptors within the bottleneck, which differ between species and also shift depending on local weather conditions (Vansteelant *et al.* 2014). In early autumn, high temperatures typically result in strong

Table 1. Diurnal raptors recorded at Batumi Raptor Count between 2008 and 2019, with numbers representing mean annual counts and record day and year counts since consistent monitoring effort began, in 2011. Species in **bold** are the target species for which abundance and demography are monitored systematically. Species in blue are recorded because: (i) they can potentially be confused with target species (e.g. most *Clanga* and *Aquila* eagles); (ii) they are easy to identify and count among all other raptors (e.g. Short-toed Eagle and Osprey); or (iii) they are threatened species (e.g. Egyptian Vulture and Saker Falcon). Note: * numbers based on the 2008–09 pilot counts; ** numbers based on the 2008–09 pilot counts and additional data for these species in 2014–17.

diurnal raptor species	mean year count	record year count	record day count
Osprey *Pandion haliaetus*	124	147	21
Black-shouldered Kite *Elanus caeruleus*	0	1	1
Egyptian Vulture *Neophron percnopterus*	26	40	7
Honey-buzzard *Pernis apivorus*	528,059	666,364	178,796
Oriental Honey-buzzard *Pernis ptilorhynchus*	18	38	9
Griffon Vulture *Gyps fulvus*	4	9	3
Black Vulture *Aegypius monachus*	0	1	1
Short-toed Eagle *Circaetus gallicus*	1,444	1,788	453
Lesser Spotted Eagle *Clanga pomarina*	7,748	9,509	5,398
Greater Spotted Eagle *Clanga clanga*	481	708	243
Booted Eagle *Hieraaetus pennatus*	6,528	7,370	881
Steppe Eagle *Aquila nipalensis*	589	965	428
Eastern Imperial Eagle *Aquila heliaca*	37	62	12
Golden Eagle *Aquila chrysaetos*	0	2	1
Levant Sparrowhawk *Accipiter brevipes* **	3,810	6,402	1,549
Eurasian Sparrowhawk *Accipiter nisus* *	7,066	7,294	1,228
Northern Goshawk *Accipiter gentilis* *	16	19	3
Marsh Harrier *Circus aeruginosus*	6,566	7,605	1,113
Hen Harrier *Circus cyaneus*	36	64	9
Pallid Harrier *Circus macrourus*	1,414	2,353	539
Montagu's Harrier *Circus pygargus*	6,748	10,808	3,323
Red Kite *Milvus milvus*	0	1	1
Black Kite *Milvus migrans*	149,404	240,743	38,140
White-tailed Eagle *Haliaeetus albicilla*	4	7	2
Rough-legged Buzzard *Buteo lagopus*	0	2	1
Long-legged Buzzard *Buteo rufinus*	5	49	8
Common Buzzard *Buteo buteo*	11	19	7
'Steppe Buzzard' *Buteo buteo vulpinus*	292,419	541,226	244,753
Lesser Kestrel *Falco naumanni* *	228	295	75
Common Kestrel *Falco tinnunculus* *	326	440	86
Red-footed Falcon *Falco vespertinus* **	479	1,884	870
Eleonora's Falcon *Falco eleonorae*	1	3	1
Merlin *Falco columbarius* *	7	8	4
Hobby *Falco subbuteo* *	553	554	70
Lanner Falcon *Falco biarmicus*	0	1	1
Saker Falcon *Falco cherrug*	1	3	1
Peregrine Falcon *Falco peregrinus*	34	53	6

Table 2. Non-raptor species recorded systematically by Batumi Raptor Count, with numbers representing mean annual counts and record day and year counts since consistent monitoring effort began, in 2011.

species	mean year count	record year count	record day count
Turtle Dove *Streptopelia turtur*	1,234	4,571	1,748
Common Crane *Grus grus*	99	212	121
Black Stork *Ciconia nigra*	1,373	1,764	433
White Stork *Ciconia ciconia*	533	1,422	483
European Roller *Coracias garrulus*	1,302	2,161	599

evapotranspiration and cloud formation over the forests of the Lesser Caucasus. A sea-breeze circulation, pushing moist air inland and over the mountains, strengthens the formation of dense cloud cover. These clouds in turn enhance the barrier effect of the mountains, limiting the formation of strong thermals inland. As a result, the flight paths of thermal-soaring migrants such as Honey-buzzards typically shift towards the coast as cloud cover builds up during the day. From mid September onwards, the contrast in cloud cover between coast and mountains decreases, and soaring birds pass mainly through the eastern half of the bottleneck.

Daily counts take place between sunrise and two hours before sunset and are interrupted only during dangerous thunderstorms or downpours when migration is on hold. Otherwise, volunteers spend the whole day (9–12 hours) scanning the skies, counting streams and loose flocks of birds and logging them. The rapid development of local ecotourism has brought some challenges, since it is not always easy to focus on the count when large numbers of visitors swarm the count stations. Counting raptors is extremely hard work, requiring utmost concentration, especially on the peak migration days when tens or even hundreds of thousands of raptors fill the sky. To help deal with this aerial chaos, the raptors are counted when they pass the so-called 'transect line', an imaginary line that runs roughly perpendicular to the coast, across our two count stations, extending inland as far as the eye can see (fig. 1).

In order to count all target species every day, each station is staffed by 6–10 volunteers under the guidance of an experienced count coordinator. Volunteers alternate between count stations and coordinators ensure that there is a balanced composition of the daily count teams in terms of experience, identification skills and personalities. This contributes to a hospitable and constructive

Adrien Brun

243. A BRC volunteer counting a stream of Black Kites *Milvus migrans* as they leave the kettle; 2nd October 2016.

atmosphere at the counting stations, which is also one of the reasons why so many of our volunteer counters return to the project in subsequent years. For many, young and old, participating in the BRC is a gateway drug for developing a life-long raptor addiction.

From counts to knowledge

The efficiency of data recording and management has improved greatly over the years. From 2008 to 2010 we still took field notes on paper that then had to go through the error-prone and time-consuming process of manual digitisation. In 2011, we switched to palmtops, using paper notes only in cases of battery failure. In 2014, a collaboration with *Trektellen* (https://www.trektellen.nl) resulted in the development of an app that greatly improved data recording in the field. Thanks to the *Trektellen* app, our count coordinators no longer have to spend their evenings calculating daily totals and uploading them manually. Instead, data are transferred to the *Trektellen* database automatically, which in turn generates updates on the BRC website.

Before the count data are used for scientific purposes, there are additional data-processing steps. First and foremost, the use of two count stations introduces the risk of double counts. Most double counts are avoided by regular radio communication between the two count stations. In addition, every record is labelled with a code indicating at what distance and in what direction a bird or flock passed, relative to the station. This allows us to flag and remove any potential double counts. Second, many individuals are not identified to species in the field, and daily species totals must be estimated through extrapolation, using the proportions of birds positively identified. A similar approach is used to obtain daily estimates for different age and sex categories.

In 2019, with generous support from the Netherlands Biodiversity Information Facility (NLBIF, www.nlbif.nl), we were able to make a fully processed version of our dataset publicly available through the Global Biodiversity Information Facility (GBIF). We also published a detailed description of our dataset along with analytical instructions and codes (Wehrmann *et al.* 2019) to ensure that our work is entirely transparent and reproducible, and to enable the proper use of these data by third parties. Finally, despite the fact that our study period is still relatively short, our targeted count strategy has resulted in a high-quality dataset, yielding sufficient statistical power to reliably detect moderate to strong population changes for most target species. Moreover, because we record age information for a large sample of birds, we can assess what demographic changes and age-specific changes in migration timing are underlying trends in the species' overall abundance and phenology (Vansteelant *et al.* 2020).

The BRC raptor migration calendar

Since 2008, and with the most recent addition of a Black-shouldered Kite *Elanus caeruleus* in 2019, no fewer than 36 species of diurnal raptor have been recorded (table 1). With good timing and a little luck, more than 20 species can be seen in a single day.

Early season

August and early September is probably the most rewarding period for less experienced raptor watchers. While the later part of the season offers more in terms of species diversity, the sheer number of migrants early in the season, combined with the 'organised' nature of the bulk of the migration, makes for an excellent introduction to raptor identification and migration dynamics.

Sunrise, a little after 06.00 hrs in late August, generally marks the start of harrier migration, which can quickly see a station surrounded by flocks – or rather streams – of ringtail harriers. These are predominantly Montagu's Harriers, but occasional Pallid Harriers are already occurring, necessitating careful identification by counters and visitors alike. Besides the harriers, compact flocks of Turtle Doves and large but loose flocks of Rollers (sometimes of over 100 birds) can be seen rushing through the bottleneck in the early hours of the day. After a mid-morning 'lull', numbers start to increase quickly around midday and thousands to multiple tens of thousands of Honey-buzzards pass by the stations. Later in the day, the number of birds declines, but diversity often remains high until sunset, as birds try to make the most of every remaining thermal while simultaneously trying to find a roost site for the night.

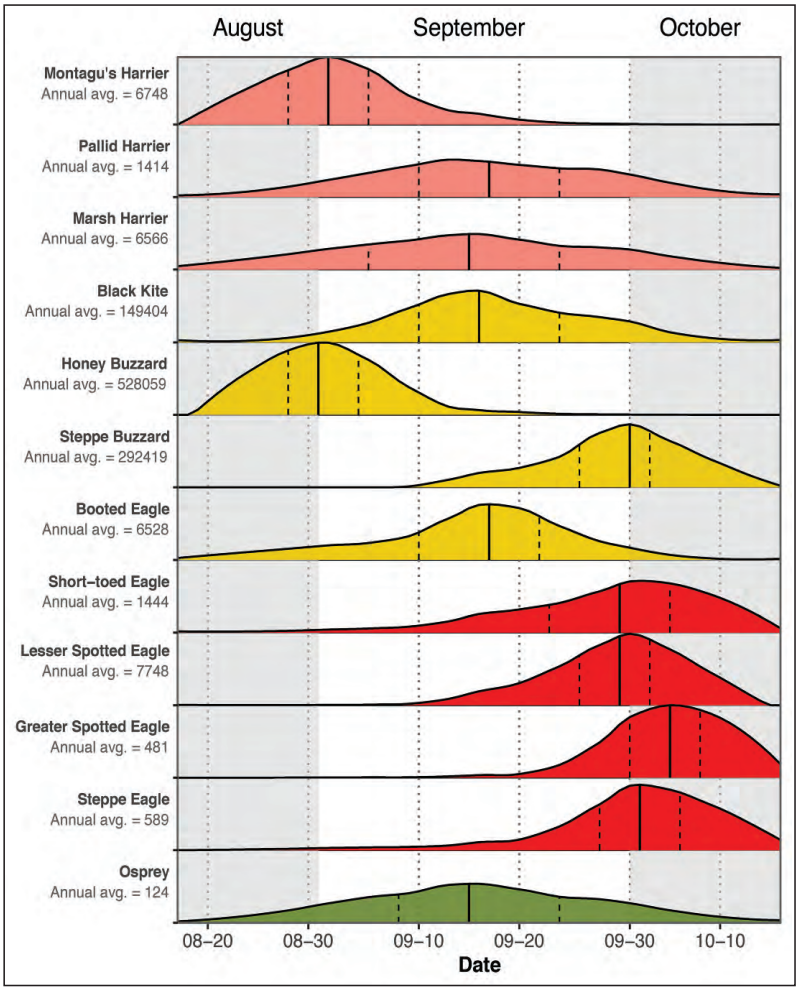

Fig. 2. Relative intensity of migration for the most common raptor species in the bottleneck (annual count average >100 birds) within our standardised monitoring period (17th August to 16th October). Colours denote morphological groups (pink = harriers, yellow = medium-sized raptors, red = large eagles, dark green = other raptors). Vertical lines correspond with the species' Q25 (dashed), median (solid) and Q75 (dashed) quantile passage dates. Hence the central 50% of annual passage occurs in the period marked by the two dashed lines.

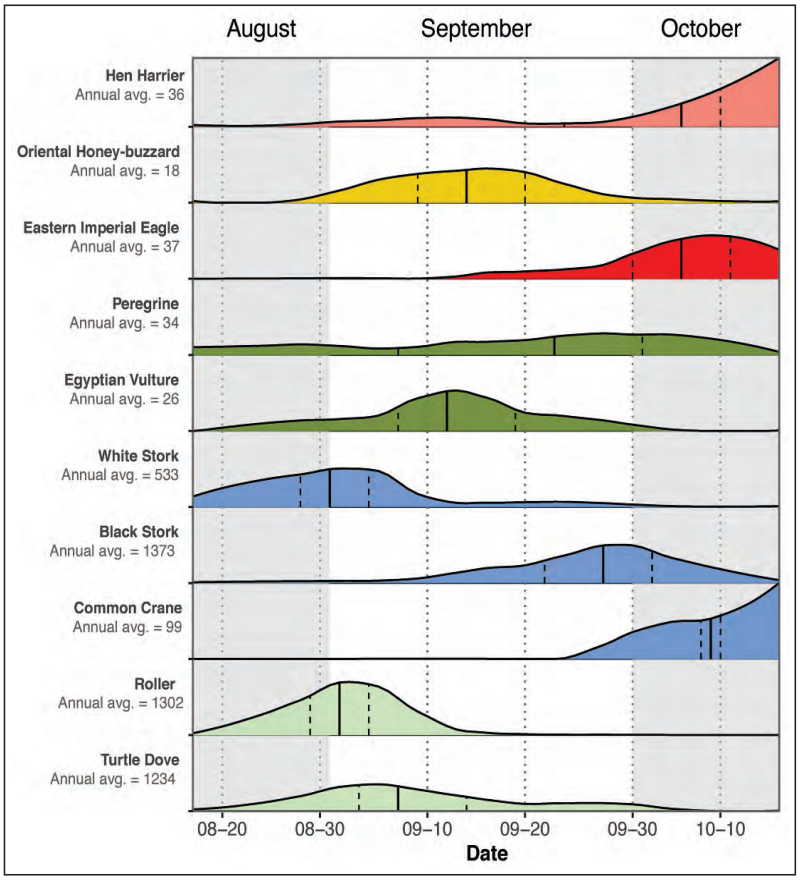

Fig. 3. Relative intensity of migration for other characteristic species in the Batumi bottleneck within our standardised monitoring period (17th August to 16th October). Colours denote morphological groups (pink = harriers, yellow = medium-sized raptors, red = large eagles, dark green = other raptors, blue = storks and cranes, light green = other non-raptors). Vertical lines correspond with the species' Q25 (dashed), median (solid) and Q75 (dashed) quantile passage dates. Hence the central 50% of annual passage occurs in the period marked by the two dashed lines.

Cloud cover early in the season is generally thick: strong evapotranspiration typically obscures the morning's blue firmament behind thick clouds in less than an hour. Such conditions cause the 'tidal' movement of clouds between the Lesser Caucasus and the coast over the course of the day, thus pushing good numbers of birds close to the stations (Vansteelant *et al.* 2014). Thunderstorms occur frequently at night, but occasionally the weather turns bad around midday as well. Visibility may then drop to just a few metres, just enough to distinguish the silhouettes of raptors perched in the trees surrounding the stations, sitting out spectacularly intense downpours. When the rain stops, birds will take off again almost immediately, testament to their strong migratory restlessness. The weather is generally warm (25–30°C) and humid; the observers' climb to the stations can be difficult but at the count stations conditions are comfortable and the journey to the top is quickly forgotten once the spectacle in the sky starts to unfold.

Bart Hoekstra

244. A juvenile Honey-buzzard *Pernis apivorus* cruising past the count station; 15th October 2018.

Honey-buzzard

The Batumi bottleneck is probably best known for the incredible migration of Honey-buzzards. This species is among the earliest of the raptors to leave Europe for sub-Saharan wintering grounds. The concentrations of Honey-buzzards at Batumi are among the largest congregations of any soaring bird in the African–Eurasian flyways, with a mean annual total of 528,059 individuals (mostly adults – see below), which represents an extraordinary 120% of the most recent global breeding population estimate (Vansteelant *et al.* 2020; www.birdlife.org). The species' migration timing is very consistent between years and the last week of August and the first week of September are practically guaranteed to see peak migration (fig. 2), including frequent days with multiple tens of thousands of individuals passing the bottleneck. The all-time daily record stands at a staggering 178,796 individuals (3rd September 2012), equivalent to two or three times the annual passage at watch-sites in the west African–Eurasian flyway.

The vast majority of the adults – so far there is only one record of a 2CY bird at Batumi in autumn (Wright *et al.* 2019) – pass through substantially earlier than juveniles, with an average lag of about ten days between the two groups. Besides the difference in timing, juveniles always occur in much lower numbers than adults: on average, c. 30,000 juveniles are recorded in autumn. No other monitored species at Batumi, or in any other European bottleneck for that matter, shows such a strong difference in timing and abundance between age classes (Vansteelant *et al.* 2020). The tendency of juvenile Honey-buzzards to drift over a broad front with side winds, rather than to converge in overland flyways, has also been confirmed by ringing and tracking data (Schmid 2000; Hake *et al.* 2003; Vansteelant *et al.* 2017). Therefore, it is perhaps not surprising that annual variability of juvenile counts constrains our ability to monitor breeding success for this species. That said, and despite Honey-buzzards being a popular quarry among poachers in the eastern Black Sea flyway (Jansen 2013; Sándor *et al.* 2017), we have not detected any trends in adult counts of this species either, suggesting a stable source population.

Compared with the other 'bulk species' at Batumi (the 'Steppe Buzzard' *Buteo buteo vulpinus*, which occurs in late September), the migration strategy of the Honey-buzzard is one of order and efficiency. Birds tend to organise into clear streams and follow a resolute southbound path, interrupted only by occasional monsoon-like showers. With their long and flexible necks, and inquisitive

head-turning, they indeed give the impression of scanning around to follow what their most efficient conspecifics are doing, and assessing whether our presence on the hilltops poses any danger.

Montagu's Harrier

The Montagu's Harrier is the first of the harriers to move south (fig. 2) and makes up the bulk of the ringtail harriers counted in the bottleneck, with 6,748 birds per autumn on average. Migration timing is comparable with that of the Honey-buzzards, with a similar peak in the last week of August/first week of September; their timing within the day is vastly different, however. Since harriers spend a much higher proportion of their migration in active flight (as opposed to soaring), a substantial amount of the daily passage occurs in the first few daylight hours (Vansteelant *et al.* 2014). Observers who venture to the stations at first light may witness the spectacular passage of several hundred Montagu's Harriers per hour.

The ability to migrate in active flapping flight allows the harriers to choose a much greater variety of routes than obligatorily soaring migrants, resulting in comparatively high annual variability in counts and limiting our ability to detect moderate trends in abundance below ±10%. Nevertheless, although we can detect no trends for non-juveniles, a strong and statistically significant decline in the number of juvenile Montagu's of 17% per year is reason for concern. Notwithstanding the annual variation in numbers, we believe it is unlikely that this decline is driven by shifts in migratory behaviour (such as variation in timing or routes), and is more likely to reflect a real decrease in breeding success (Vansteelant *et al.* 2020).

Mid season

Mid season sees the highest species diversity, when over 20 species of raptors can frequently be observed in a single day. While species diversity is maximised, the total numbers of birds are somewhat lower, since the Black Kite *Milvus migrans* is the only one of the more-abundant species to migrate predominantly in this period: most Honey-buzzards have passed by the first week of September and 'Steppe Buzzards' do not arrive in force before the last week of the month. This calmer period in terms of numbers nonetheless requires extra effort from counters to separate the greater number of possible species (figs. 2 & 3): small numbers of Oriental Honey-buzzards *Pernis ptilorhynchus* mix with their European counterparts, the earliest 'Steppe Buzzards' have to be separated from juvenile Honey-buzzards, Pallid and Montagu's Harriers appear in similar numbers, solitary Egyptian Vultures *Neophron percnopterus* attempt to sneak past unnoticed and the first signs of eagle migration start to show. This is a really challenging, but rewarding, period for observers. Besides the raptors, there are many other species to enjoy, such as Black Storks (1,373 birds per year, on average; table 2, fig. 3) and the migration of tens of thousands of European Bee-eaters, which provide the background soundtrack for much of the first half of the monitoring period.

Conditions for counting become gradually more comfortable, with generally pleasant temperatures (20–25°C), more variety in cloud cover, diminishing problems with heat haze and generally spectacular light. Especially after a night's rain, the skies can be so clear that parts of the Greater Caucasus (c. 200 km distant) are visible and one can be constantly surprised by the distance at which accurate raptor identifications can still be made.

Bjorn Alards

245. This is how we prefer to see our harriers. This is an adult female Montagu's Harrier *Circus pygargus*, showing clear signs of arrested primary moult, a good identification pointer to separate this species from Pallid Harrier *C. macrourus* in autumn; 2nd September 2017.

David Erterius

246. On clear days later in the season, the snow-covered peaks of the High Caucasus serve as a beautiful backdrop for watching raptors, such as these Black Kites *Milvus migrans* seen from Sakhalvasho; 24th September 2019.

Black Kite

One of the world's most widespread raptors, the Black Kite is the third most numerous raptor at Batumi. When annual monitoring started, in 2008, only 60,000 individuals were recorded, but by 2019 the total exceeded 240,000 individuals. In between, we have recorded a highly consistent increase of 10% per year. This trend encompasses a significant increase in non-juveniles (+11% per year), plus a more variable increase in juveniles (+9% per year). We speculate that annual survival of Black Kites is high, perhaps due to improving conditions in the wintering areas. Growing numbers of Black Kites winter at landfill sites in the Middle East, thus avoiding a perilous journey across the Sahara (Vansteelant *et al.* 2020).

Compared with the other 'bulk species', the migration period of Black Kites is protracted, with peak days of just over 38,000 birds in mid September; there is hardly a day in the season without at least a few dozen birds passing through (cf. Marsh Harrier). Black Kites occur even in the most adverse weather conditions, or when thermals are weak, since they are not reluctant to use active flapping flight and thus continue migrating when most other species seem to have given up.

Marsh Harrier

The Marsh Harrier is the most numerous harrier at Batumi, with an average of 6,566 individuals per year, and up to 1,113 in a single day (10th September 2018). In fact, it is the staple diet for counters throughout the season, starting migration very early in the morning and having the longest migration period of all the common raptors at Batumi, spanning most of the autumn count period (Vansteelant *et al.*

Bart Hoekstra

247. A few dozen Marsh Harriers *Circus aeruginosus* of the dark morph are recorded each autumn at Batumi, where this stunning adult male was photographed on 12th September 2019.

2020; fig. 2). It also tends to keep counters (and visitors) on their toes because ageing and sexing remains a challenge and the species has a remarkable ability to blend into streams of other medium-sized raptors (see Forsman 2016 on the problems of separating dark-morph Booted Eagles *Hieraaetus pennatus*, Black Kites and Marsh Harriers). On average, around 30 males belonging to the 'dark morph' – one of the most striking of harrier plumages – are recorded every autumn, though undoubtedly some go by unnoticed.

For a species that shares strong behavioural similarities with other harriers, the between-year variability is remarkably low. We are therefore confident that this suggests a stable source population (c. 0.6% of the global breeding population; Vansteelant *et al.* 2020).

Pallid Harrier

When the BRC monitoring started, it quickly became clear that the congregation of Pallid Harriers in the bottleneck was unprecedented. With up to 539 individuals recorded in a single day (24th September 2017), and on average 1,414 individuals recorded each year, Batumi is by far the best site in the world to observe this species on migration. Yet numbers are erratic and unpredictable, extremely inconsistent between seasons, with high variability in migration timing and even regular switching of dominant age classes (juveniles vs. non-juveniles) from year to year (and hence counts are of limited value for detecting population trends; Vansteelant *et al.* 2020). Bearing in mind that numbers are so unpredictable, visitors can expect to encounter this species mostly in mid September.

Compared with the leisurely flap-soaring flight of Montagu's Harriers, Pallid Harriers tend to move through the bottleneck much more purposefully, with a migration strategy that appears less dependent on the availability of thermals. Consequently, inclement weather conditions can provide splendid views of this species, the males especially, against the darkened backdrop of the densely vegetated Lesser Caucasus. On a couple of occasions, lucky observers have even seen them perching on the count station.

Booted Eagle

Around 3% of the global breeding population of Booted Eagles make use of the Batumi bottleneck. The ratio of light-morph to dark-morph Booted Eagles at Batumi is roughly 50:50 (including the comparatively rare 'intermediate' or rufous morph as a dark morph). This compares with up to around 90% of birds being light morph in the Iberian Peninsula, and with 95–100% dark morph in Mongolia and Kazakhstan (Bosch 2019). This leaves roughly half of the population at Batumi easy to identify but dark birds are often a challenge for inexperienced raptor watchers.

John Wright

248. This 2CY male Pallid Harrier *Circus macrourus*, ploughing through the rain on 28th September 2017, shows a striking combination of juvenile features, such as a well-marked pale collar and the remains of a dark 'boa', and adult features such as the black wedge in the outer primaries.

Bart Hoekstra

249. More than 60% of the Booted Eagles *Hieraaetus pennatus* that pass through the bottleneck are counted to the west of the Sakhalvasho coast station, within 2.5 km of the coastline; 12th September 2019.

Most raptors at Batumi preferentially follow the 'tidal' movement of the cloud cover, but Booted Eagles show a remarkable preference for following the coastline (Vansteelant *et al.* 2014), such that a very large proportion of the annual flight is recorded from our Sakhalvasho count station. During the peak period they seem to follow their own 'Booted Highway', an almost continuous stream of semi-solitary individuals. Perhaps because of this behaviour there is low annual variability in Booted Eagle counts, allowing us to distinguish even moderate (below ±10% per year) trends in abundance. Tempered only by an unusually weak passage in 2018, we have seen an increase in the number of non-juveniles from 4,000 to over 6,000 per year, and simultaneously a consistent and strong decline in the number of juveniles of 10% per year (Vansteelant *et al.* 2020). We can only speculate about the cause of these trends but it is interesting to note that, without consistent effort in ageing individuals, we would have assumed that the population is stable or even increasing. This highlights the fact that simple annual totals can mask obvious changes in the demographic structure of a population, and that better-quality information enables warning signs to be detected earlier.

Late season

The last ten days of September is the period when eagle migration, which will continue to the end of the count (and beyond), is in full swing. Those that winter farthest south, the Lesser Spotted Eagles *Clanga pomarina*, lead the pack, followed by Steppe *Aquila nipalensis*, Greater Spotted *C. clanga* and some Eastern Imperial Eagles *A. heliaca*. Identification of these birds is a major challenge for many counters, especially the separation of Lesser Spotted, Greater Spotted and (sub)adult Steppe Eagles when minimal light is reflected from below (as at the densely vegetated count stations at Batumi). Nevertheless, our approach to data analysis does not necessitate the identification of every single individual, so we record species-level identifications only when we are confident and many large eagles can and do simply go down as 'large eagle sp.' (Wehrmann *et al.* 2019).

The eagles, however, are few in number compared with the most abundant migrant at this point: the 'Steppe Buzzard'. In the last week of September and the first week of October, Steppe Buzzards turn the airspace of the bottleneck into some of the most chaotic imaginable, owing to their sheer numbers and their highly disorganised flocking

John Wright

250. Juvenile Eastern Imperial Eagle *Aquila heliaca*, bathed in delicate sunlight; 4th October 2017.

behaviour. Whereas Honey-buzzards organise themselves into massive but neat streams, the Steppe Buzzards instead seem to 'blanket' the bottleneck and utilise all the available airspace. Since the late season often sees consecutive days with heavy rain that block the migration, the days that follow the rain can be some of the most rewarding birding experiences – when birds that have accumulated and waited for conditions to clear finally arrive in full force. The largest-ever day count at Batumi – 258,516 raptors on 2nd October 2014 – was in this period and mainly comprised Steppe Buzzards (244,753 of them).

If the weather is not too disruptive, raptor migration slows markedly towards the end of the monitoring period. In addition, a greater proportion of the 'late' migrants (relative to the species' expected phenology) are starting to show signs of misfortune, such as birds crippled by non-lethal shots. Although they can be slow in terms of numbers, the final days of the counts are some of the best in terms of observation quality. Since the thermals have by then weakened considerably, the remaining migrants spend a much longer time gaining height while soaring and, as a result, can often be observed for long periods and from all possible angles. Hen Harriers *Circus cyaneus* increase in number day by day and hundreds of Eurasian Sparrowhawks will be passing the count stations high and low, left and right (making them too difficult to monitor consistently). Common Cranes can be seen soaring among eagles, concentrated flocks of Wood Pigeons *Columba palumbus* and Stock Doves *C. oenas* rush through the bottleneck and the impressive migration of passerines starts to pick up pace. The splendid views and the decrease in numbers for species we monitor is a welcome change of pace after a hectic season and over 1,000,000 raptors counted.

Lesser Spotted Eagle

The first, and the most numerous, eagle to appear is the Lesser Spotted Eagle (7,748 birds per year on average). Since Batumi is situated close to the eastern edge of the bird's range, it is not as numerous as at watch-sites on the western side of the Black Sea, but at least 10% of the world breeding population

Rafa Benjumea

251. Lesser Spotted Eagles *Clanga pomarina* show remarkable plumage variation and can be hard to separate from other *Clanga* and *Aquila* species under overcast conditions – not an issue with this bird; 30th September 2019.

uses the eastern Black Sea flyway every year. Colour-ring resightings have shown that birds originate from at least as far west as eastern Poland and as far north as Estonia and Finland. Although juvenile counts are too variable to detect moderate trends at this stage, the less variable non-juvenile counts indicate no consistent changes in the source population (Vansteelant *et al.* 2020).

Like the other *Aquila* and *Clanga* eagles, Lesser Spotted Eagles seem to prefer a more inland migratory route, probably because they can then utilise both thermal updrafts and those generated by an upward deflection of horizontal winds by the mountains. This usually makes the Shuamta count station the place to be for eagle enthusiasts. However, the peak days for eagle migration (with multiple thousands of eagles crossing the bottleneck at once) have consistently yielded higher counts from the Sakhalvasho station. In short, both stations offer good views of the eagles.

Short-toed Eagle

Although all other highlighted species in this overview are classified as 'priority' species for our monitoring protocol, the Short-toed Eagle *Circaetus gallicus* is a 'secondary' species because our counts of, on average, 1,444 birds per year represent a smaller fraction of its global population than for other common raptors at Batumi. However, this species is so easy to identify that we can monitor it without much additional effort: its striking plumage, large size and flapping flight that

John Wright

252. The deep and slow wingbeats of the Short-toed Eagles *Circaetus gallicus* make them stand out like giants among many other smaller raptors; 6th October 2017.

Bert Willaert

253. It is not difficult to find evidence of illegal raptor shooting along Georgia's Black Sea coast. Hunters typically remove and discard the wings, legs and heads of the birds they shoot.

Bert Willaert

254. A local hunter scans the horizon for incoming raptors; 8th September 2011. He knows that the cloud cover developing over the Lesser Caucasus in the background will eventually steer the stream of raptors towards him.

gives it the appearance of moving in slow motion make identification much more straightforward than for the other large eagles. And who could resist a species with such a mesmerising pair of eyes?

Our trend analysis has shown remarkably little variation in the annual counts of especially non-juveniles of this species during 2011–18 (Vansteelant *et al.* 2020). A small number of juveniles probably pass through after our official monitoring period has ended, which is one of the reasons why we have extended the recording period by an additional five days in October from 2019.

Causes and consequences of illegal shooting

The illegal shooting of raptors along the eastern Black Sea flyway is a distressing experience to witness. During the very first BRC counts, volunteers were often confronted by the remains of raptors left behind at the count stations, occasionally seeing raptors dropping from the sky and, at the same time, having – mostly friendly – interactions with the hunters. We naturally wanted to know more about the magnitude and scale of this practice, as well as the impact on the migrating raptor populations.

In his pioneering research on raptor trapping and shooting in Georgia, the Dutch ecologist Erwin van Maanen had already estimated that several thousand raptors are shot every autumn, based on an extrapolation of remains found around falconry hides (van Maanen *et al.* 2001). In order to model the extent and the magnitude of the illegal hunting more accurately, BRC co-founder Johannes Jansen conducted a two-year field study of hunting pressure in the region (Jansen 2013). The first step was to map shooting locations in the field, and to use these data to map the distribution of suitable shooting locations by a MaxEnt model (fig. 4), which essentially correlates hunting occurrence records with environmental characteristics (e.g. landscape). Illegal hunting was found to be restricted mostly to mountain ridges of certain altitude and orientation, close to the coast. Such hotspots are rare, and only five were identified, but at these places very high numbers of raptors are shot. These results give hope that

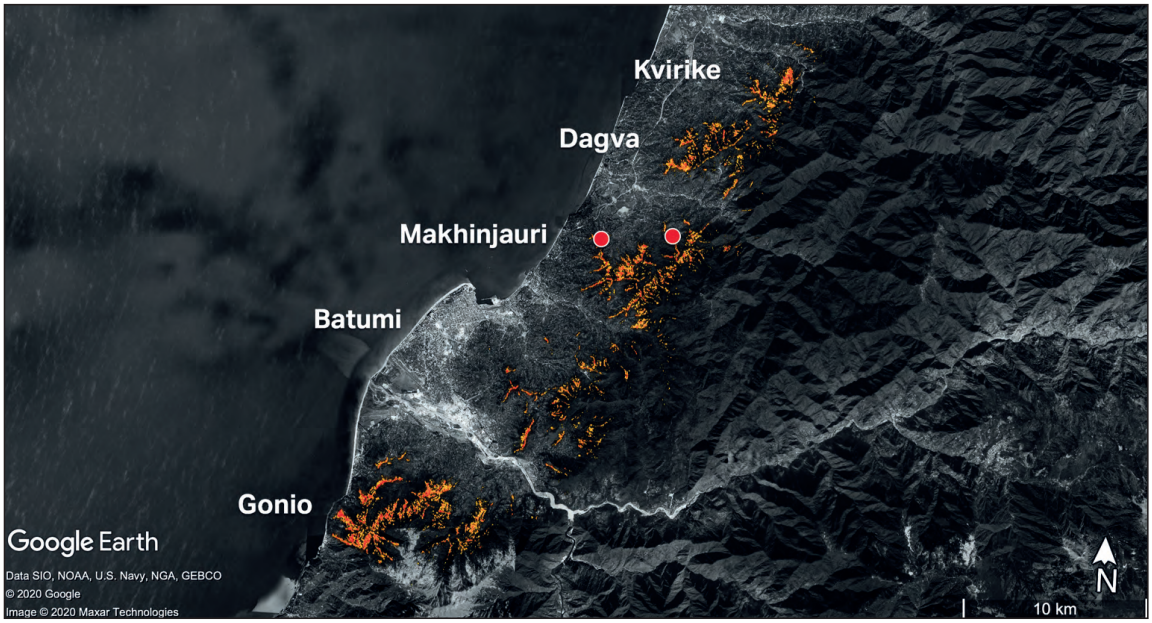

Fig. 4. A distribution model of illegal raptor-shooting activity along the eastern Black Sea coast. The hotspots (in orange) are characterised by the availability of easily accessible, northward-facing ridges (from Jansen 2013). The red dots are the locations of the two hilltop count stations.

localised conservation efforts could have a relatively large impact on the total number of raptors that fall victim to illegal hunting in the area. But how substantial are the losses to begin with?

To calculate the overall impact of illegal hunting on the migrant raptor population, Jansen joined hunters from various villages as they ventured into the field, allowing him to record the number of casualties of various species at hunting stands, the number of shots fired at various species and the ratio of hits/shots. Next, this information was extrapolated for the entire region using the previously constructed model (fig. 4). Jansen (2013) estimated that 9,046 ±1,251 raptors were shot every autumn. This might not be of conservation concern for the most abundant (and most frequently shot) species, such as Honey-buzzard and 'Steppe Buzzard', for which respectively only 1.14% and 0.66% of the migratory population are affected. However, they are still considerable numbers, given that these same birds are also targeted by shooters in countries further along their flyway (i.e. Lebanon). Furthermore, the number of casualties among sparrowhawks and harriers involved up to 5% of their respective annual migration counts at the Batumi bottleneck. These species are more prone to being shot because of their tendency for low-altitude, fly–forage migration.

Hunters showed a remarkable willingness to cooperate with Jansen, and were open about their activities. The motivations of the hunters for shooting raptors illegally were explored by a questionnaire survey. A majority (70%) of hunters who responded said that they shoot raptors mainly for food, while a smaller majority (58%) indicated that they also shoot raptors for amusement (Jansen 2013). Following up on this work, Anna Sándor and her team set out to study the socio-economical aspect of the hunting in more detail. An important outcome from Sándor's study was that shooting in the Batumi bottleneck cannot be considered as a form of subsistence hunting. Without using questionnaires, and by letting hunters tell their own story, she found that local men first and foremost hunted for fun, rather than for food, and that many learnt to shoot from their fathers (Sándor *et al.* 2017; Sándor & Anthony 2018). Indeed, it is not unusual to encounter hunting parties including young boys who cannot yet fire a rifle but will help by taking up a good vantage point to give shooters instructions about incoming flocks of birds. Importantly, Sándor *et al.* also found that hunters have a positive attitude towards hunting ethics (such as no shooting in spring, and the concept of quotas), which provides an opportunity for mutually agreeable solutions towards the sustainable

exploitation of migrant birds. Finding solutions is never easy, as we have learnt from various conflicts with and among local community members throughout the years, especially in relation to ecotourism development. However, the state of our project and the ecotourism sector in Sakhalvasho today proves that these challenges can be overcome given time and effort.

Frank Franken

255. BRC volunteers frequently record raptors with severe wing damage. Based on our experience, we believe that most of these birds, such as this Honey-buzzard *Pernis apivorus* on 2nd October 2011, sustained non-lethal shots with (probably home-made) lead pellets.

Towards a sustainable future for birds and people

At BRC we believe that sustainable conservation change can be achieved only if it comes from within the community. Therefore, we have not told anyone directly to stop poaching and have not been actively involved in alerting local law enforcement units. We do provide data and advice to local authorities. Being mindful of our privileged position as foreign guests, we mostly try to translate our ambitions for local raptor conservation into a positive and constructive project for local people. Local conservationists, organisations and communities should ultimately step up against unsustainable and unethical hunting practices, using ecotourism and respect for nature and international guests (people and birds) as important factors for doing so.

Our experience suggests that local attitudes towards raptors have indeed started to change in our host communities, and that they will continue to do so now that local government has invested in the construction of a permanent bird observatory in Sakhalvasho, as well as the improved accessibility of both villages, which ultimately benefits all community members. It is, however, hard to measure our impact on illegal hunting pressure directly. In autumn 2014, the newly established SABUKO, now the Georgian BirdLife partner, continued field surveys to set up a long-term hunting monitoring scheme. However, these surveys ceased in 2015 and re-establishing such a scheme would be key to measuring the conservation impact of our work objectively. By tracking the number of shots fired (as heard from the count stations), we have some measure of the intensity of hunting, but know little about which birds they are targeting or how many are being hit and taken. We also know little about how hunting activity has developed in areas well away from our count stations. Nevertheless, we do what we can to evaluate our work, and an independent researcher will conduct a social impact study with various regional stakeholders in spring 2021.

One obvious way to increase our impact is to put Batumi on the map as a top birding destination in spring as well as in autumn. Describing the spring raptor migration through the Batumi bottleneck has also been a long-held ambition and a pilot three-year spring migration count started in 2019. A formal report of the results and decision whether or not to establish long-term monitoring in spring will appear in due course, but spectacular spring counts (in the range of 400,000–700,000 individuals; www.batumiraptorcount.org/data) clearly demonstrate the untapped potential for local communities to benefit from migration-based ecotourism in spring.

Educating future generations

Educational activities have been a core part of the BRC project since it started, by working with students in environmental sciences and education from across the Caucasus region. For many of these students, our international exchange projects were a rare opportunity to get hands-on experience with research, conservation or environmental education, and to pursue a career in these fields. Moreover, it is largely thanks to the involvement of regional students that we have had the capacity to organise educational activities for primary

and secondary schools during many of our past counts. BRC volunteers and students have given school presentations about raptors, organised a biodiversity camp for local children, written a children's book about migrating raptors, organised school field trips to the count stations and conducted numerous other outreach activities. However, as a non-Georgian, volunteer-based NGO we lack the capacity to provide such classes and field trips on a regular basis and at a regional scale. Moreover, the Georgian school year starts when we are already midway through the autumn count, and it is logistically challenging to organise extra-curricular activities during the first weeks of school.

Kalle Meller

256. Several hundred schoolchildren have now visited the BRC count stations. We are now working to provide environmental education on a regular basis at regional schools; 14th September 2012.

In response to these challenges, we are rolling out a new education programme in 2021. The core idea is that by empowering local teachers to cover raptor migration and conservation in an engaging manner with their students, we can reach a much larger portion of the regional youth in a systematic manner. BRC's environmental education coordinator, Rafa Benjumea, presented his ideas to 19 regional biology teachers in autumn 2019. Based on their enthusiastic input, and with support of BirdLife Netherlands' 'IJsvogel fund', we are now developing a training package to help teachers create 'bird clubs' at their schools, providing inspiration and materials for activities about bird ecology and conservation. Materials will be developed around species that are well known locally and, of course, that includes migrating raptors. The bird clubs will be organising their first activities in spring 2021, with teachers being coached by expert environmental educators. Thanks to support of the *British Birds* Charitable Trust, we will also be able to organise at least 15 field trips for bird clubs, visiting our new spring migration count at the Sakhalvasho observatory. Looking further ahead, the aim is to run this project for at least 3–5 years in order to further diversify and optimise educational materials and activities, and to train at least one teacher in each regional school, especially those situated in the hunting hotspots identified by Jansen (2013).

Falconers: allies in conservation?

While birdwatching is still in its infancy in Georgia, falconry is an old tradition which is practised by hundreds of men, young and old, particularly in areas along the Black Sea coast. The tradition is alive and kicking, and for many youngsters it is one of their main pastimes during autumn. In 2018 some 10–15 young falconers (aged 13–17) from the area

Bert Willaert

257. An elderly Georgian falconer has lured a female Eurasian Sparrowhawk *Accipiter nisus* into his do-ghaza net using a juvenile Red-backed Shrike *Lanius collurio* as a lure; 16th September 2011. It is not unusual for falconers to catch ten or more birds in a single morning, but they usually keep only a few heavy juvenile females to be trained for the quail hunt. This adult bird was released by the falconer later on. Provided the unnecessary killing of bycatch such as Levant Sparrowhawks *A. brevipes*, harriers and even Booted Eagles *Hieraaetus pennatus* can be stopped, the BRC believes that the migration-based falconry tradition in Georgia is sustainable from a conservation point of view.

around Poti were introduced to the BRC project by Fauna & Flora International and took great interest in our work and the count, so much so that they returned in 2019 and spent parts of the day joining the count team on station. Although there are differences in age, cultural background and perception of the natural world, these young boys share with us a strong interest in raptors in general, and particularly care about 'their' sparrowhawks – qualities we should appreciate and cherish. Moreover, it makes sense to engage falconers as stewards of raptors, while traditional falconers or *bazieri* often oppose the new trend of taking a gun along when trapping.

As highlighted by Magnin & Kurdoğlu (2017), there are legitimate conservation concerns regarding falconry in Georgia. Many falconers do kill their bycatch, and especially Levant Sparrowhawks *Accipiter brevipes*, which are considered 'badly mannered' and are used to feed the hawks-in-training, the Red-backed Shrikes *Lanius collurio* that falconers use to lure their quarry, or the dogs with which they hunt. A large proportion of especially younger falconers also shoot while trapping. Nevertheless, a conservation success story comes from neighbouring northeast Turkey, where falconers were taught a cheap egg-based feeding method for their birds and stopped killing their bycatch as a result of this (Magnin & Kurdoğlu 2017). This suggests that we too can find mutually beneficial projects for falconry and conservation. And while we often focused on engaging Georgians in the things we find interesting, such as monitoring, we have come to realise that we need to do more to make raptor conservation more tangible and relevant for them.

In the autumn of 2021 we aim to involve young falconers in a new project that will focus on ringing (and tagging) raptors, including those species that frequently end up in their nets as bycatch. We have trialled such projects in the past, training falconers to identify, measure and ring birds. The falconers typically find this rewarding, and we now have the support of a small conservation fund from WWF Netherlands to build a conservation alliance with the falconer community. We are hopeful that participants will marvel at migration, gain a deeper understanding of the species they encounter in their nets and perhaps contribute to raptor research and conservation in the long term. Inspired by the initiatives of WWF and BirdLife in Turkey some 30 years ago, we want to provide falconers with cheap alternative feeding methods for their birds. We now have the means to run this project for one year, but hope that further support will enable this work to continue for at least three years. This should allow us to reach a sufficiently large pool of (young) falconers, who can in turn influence the wider Georgian falconry community. Based on ringing data, measurements, their experiences with a new feeding method, and hopefully some GPS tracks, falconers will have fascinating stories to share with their peers at falconry festivals and through social media. And while a good falconer commands considerable esteem in Georgia, they might just become influential stewards for raptor conservation in this beautiful and hospitable country.

Triin Kaasiku

258. BRC chairman Dries Engelen (centre) introduces a group of young falconers to bird ringing at Sakhalvasho; 30th August 2018.

Conclusions

Over the past decade the volunteer-based Batumi Raptor Count has grown into an internationally respected migration monitoring and conservation project. Our standardised counts offer a uniquely valuable tool for monitoring raptor populations in the little-studied east African–Palearctic flyway. Having put Batumi on the map as a top birding destination, the BRC project has had a large and positive economic impact on the communities of Sakhalvasho and Shuamta, which in turn has greatly increased societal and political support to reduce the widespread illegal raptor shooting in the region. The BRC project has also provided a stimulating environment for regional schoolchildren to learn about raptor migration and conservation, and for university students to develop skills in research, conservation and environmental education.

We now have ambitions to increase our local impact, by putting Batumi on the map as a top birding destination during spring as well as autumn; to expand our reach to other communities in the region by developing educational materials and supporting teachers in establishing 'bird clubs'; and to build an alliance with traditional Georgian falconers as stewards for raptor conservation. Better enforcement of environmental laws by local governments will be needed to further reduce the illegal hunting in Georgia. BRC has made considerable progress introducing more favourable attitudes towards migrating raptors among Georgian society. With increasing local investment in ecotourism, we are more determined than ever to scale up our constructive, non-confrontational conservation model. The more people that visit Georgia because of the raptor migration, and the more alliances we can build with Georgian stakeholders, the more leverage we have to bring this gargantuan task to a happy ending. We warmly invite the British birding community to join us or support us on this exciting journey.

Count, support, donate!

The BRC welcomes novice as well as experienced migration counters to volunteer for periods of at least two weeks (www.batumiraptorcount.org/get-involved). We encourage tourists visiting the watch-sites independently to book accommodation in local guesthouses (www.batumiraptorcount.org/guesthouses). The autumn 2020 count has been cancelled due to the ongoing Covid-19 pandemic, but we hope that activities and travel opportunities may return to normal by spring 2021. Stay up to date about volunteer applications and other news by signing up for our newsletter via our website; you can also follow us on Facebook or Twitter (@BatumiRaptors).

Monika Schirutschke

259. Some 3,000–6,000 Levant Sparrowhawks *Accipiter brevipes* (c. 7–25% of the global population; www.birdlife.org) pass through Batumi every year. Several hundred may be shot annually (Jansen 2013) and the number killed as bycatch by falconers is probably in the same order of magnitude (van Maanen *et al.* 2001). This bird was photographed on 2nd September 2012.

The BRC project is increasingly dependent on private donations to continue its long-term monitoring. To run a well-staffed, full-season autumn count costs some £17,500–20,000, to ensure free participation for Georgian students and conservationists. Donations can be made through bank transfer or online payment processors (see details at www.batumiraptorcount.org/donate). All donors receive the annual BRC magazine, which includes a detailed financial report. The BRC team welcomes proposals for donations towards specific projects, or material contributions such as second-hand optics.

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The BRC organisational team has seen different international volunteers taking responsibilities for the continuing work of the organisation. Two of the founding fathers, **Johannes Jansen** (Belgium, 2008–) and **Wouter Vansteelant** (Belgium, 2008–), are still active and have been joined by, among others, **Bart Hoekstra** (the Netherlands, 2018–), **Dries Engelen** (the Netherlands, 2014–), **Folkert de Boer** (the Netherlands, 2012–), **Rafa Benjumea** (Spain, 2013–), **Triin Kaasiku** (Estonia, 2018–), **Jasper Wehrmann** (Germany, 2011–17) and **Simon Cavaillès** (France, 2013–18) during the last 12 years. The project would never have been so successful if it was not for the dedication of so many counters and coordinators, such as **Diego Jansen** (the Netherlands), **Pia Fetting** (Germany) and **Aki Aintila** (Finland).