Butterflies in Turkey's Kaçkar Mountains

Evrim Karaçetin and Hilary Welch

Surveying butterflies in Turkey's Kaçkar Mountains was a once-in-a-lifetime experience, though at times rather a nail-biting one. On the narrow, cliff-hugging roads, confronting oncoming traffic was a test of the driver's reversing skill—and of the passengers' nerves. However, the steep mountainsides, deep valleys, and fast-flowing rivers that make driving hazardous also help make this region of northeast Turkey important for butterflies. A three-hour journey will take you from hot dry shrublands along the Çoruh River, up leafy valleys past sun-drenched hay meadows, through subalpine pastures and forests, and finally to sparsely vegetated peaks, traversing a diversity of ecosystems that provide niches for many different species.

The Kaçkars rise steeply from the Black Sea's southeast coast and lie at the crossroads of two continents. They are part of the southwestern arm of the Caucasus Mountains, a formidable range rising to 18,500 feet (5,640 meters), which spans the gap between the Black Sea and

The stunning landscape and flower-filled meadows of the Kaçkar region are a big attraction to butterfly watchers as well as to the butterflies themselves. A butterfly camp held in 2009 was attended by enthusiasts from Turkey and four other countries, and participants saw more than 140 species of butterflies. Photograph by Hilary and Geoff Welch.

The higher areas of the Kaçkar Mountains are dominated by subalpine and alpine meadows. The Russian heath (*Coenonympha leander*) is a species limited to these open habitats. Photograph by Evrim Karaçetin.

the Caspian Sea and forms a major physical and ecological divide between Asia and Europe. Politically, the Caucasus region includes Georgia (which shares the Black Sea coast with Turkey), Armenia and Iran in the south, and Azerbaijan on the Caspian to the east. To the north, the mountains extend into Russia.

The Caucasus is recognized as a global hotspot for wildlife. Twenty-five percent of the plant species in the region, 23 percent of the reptiles, 17 percent of the amphibians, and 13 percent of the mammals, are found nowhere else in the world. In northeastern Turkey, there are clusters of sites that are internationally recognized as important for birds and plants. Despite global awareness of the region's wildlife, no assessment of the overall importance of the Caucasus for butterflies had been made until about five years ago, when construction began on the Baku-Tbilisi-Ceyhan pipeline.

Built to transport crude oil from oil fields in the Caspian Sea to Ceyhan, a Turkish port on the Mediterranean coast, the pipeline passes through northeastern Turkey. The pipeline company's Environmental Investment Programme funded a project to identify the priority areas for wildlife conservation in the Turkish Lesser Caucasus, an area of 13,500 square miles (35,000 square kilometers). This project studied data for wildlife—including butterflies—and found that the 700-square-mile (1,800-square-kilometer) area around the town of Yusufeli in the Kaçkar Mountains was a remarkably rich center of biological diversity: a hotspot within a hotspot.

This concentration of biodiversity demands conservation action. Consequently, the Lesser Caucasus team initiated a follow-on project to help people in the area develop sustainable livelihoods that would actively conserve the region's wildlife. Supported by 1.8 million euros of funding from the European Union's Environment in Developing Countries Programme (roughly equivalent to 2.25

The Apollo (*Parnassius apollo*) is found in high-altitude areas across Europe and Asia. As global warming causes temperatures to rise and habitats to change, this species has little room to move higher in the mountains, and so is at risk. Photograph by Evrim Karaçetin.

million dollars), the project was implemented by a partnership of nongovernmental organizations with a university and a government ministry.

A driving force behind the effort to protect butterflies has been Doğa Koruma Merkezi (DKM, the Nature Conservation Centre). In 2008, in her role as senior conservation officer with DKM, one of the authors of this article, Hilary Welch, was given responsibility for organizing the biodiversity fieldwork in the Yusufeli region for the EU-funded project. Welch saw the task of forming the butterfly field team as both an exciting opportunity and a serious challenge, and from the start planned that lepidopterist Evrim Karaçetin and herself would be core members, so as to build their own experience and knowledge of Turkey's butterflies. Despite being born and brought up in Turkey, Karaçetin had never had the chance to visit the far northeast before; the region was not new to Welch, who is an experienced birder but a relative newcomer to butterflies. To fill the knowledge gap, the support of experienced field people was needed. Welch and Karaçetin thus counted themselves extremely lucky when three of Europe's top butterfly conservationists—Dirk Maes of Belgium, Szabolcs "Safi" Sáfián of Hungary, and Simon Spencer from Britain—agreed to join them for different periods.

The study area is located within the watershed of the Çoruh River, which drains the south and east slopes of the Kaçkar Mountains before emptying into the Black Sea on the Georgian coast. The Çoruh watershed includes the Barhal, Güngörmez, Çevreli, and Hatila rivers. The team of core members and rotating specialists, with logistical support from local project staff, carried out six weeks of tough but extremely rewarding fieldwork in this fabulous region.

Along the Çoruh River and its tributaries the hot, relatively dry climate has created a Mediterranean enclave, pro-

viding habitats for steppe butterflies. Among the species observed only here were the Turkish fiery copper (*Lycaena ochimus*), with its blazing tangerine wings, and the little tiger blue (*Tarucus balkanicus*), a delightful butterfly with both silver-blue spots and black stripes on the white underside of its wings. A butterfly which was always good to see even though not brightly colored was the Anatolian tawny rockbrown (*Pseudochazara mamurra*). The valleys along the Çoruh are also home for the Hi blue (*Polyommatus merhaba*), which seems to be endemic to this river system.

Northward and up into the Kaçkar Mountains, the dry grasslands and shrublands give way to subalpine and alpine meadows. It was here that the team found the Apollo (*Parnassius apollo*), the false heath fritillary (*Melitaea diamina*), and the Russian heath (*Coenonympha leander*), easily identified by a neat row of eyespots and silver marginal lines. In addition, the Caucasian clouded yellow (*Colias caucasica*) and Lederer's heath (*Coenonympha symphyta*), both endemic to the Lesser Caucasus, were spotted. These meadows have been managed by people living a pastoral existence for more than ten thousand years, and this has created a rich mosaic of habitats from forests to pastures. Finding ways to encourage people not to abandon traditional farming patterns in these mountains is crucial for maintaining the ecosystem and the butterflies it supports.

Moving northeast, the land drops into the Hatilla Valley. Here, the orientation of the valley and proximity of the Black Sea produce greater precipitation, and the extensive grasslands are reduced to small openings and pastures in extremely varied and lush mixed forests. Violet fritillary (*Boloria dia*) and pearly heath (*Coenonympha arcania*) were among the species recorded only in this bioregion.

During the survey, the team recorded 180 species of butterflies—nearly half of Turkey's total—including 21 species that were new to the region. Since 2008 additional species have been recorded; the Yusufeli-Artvin area alone now has a list of 201 species, a total that few European countries can beat!

Not all of the news is good, however. After completion of fieldwork at Yusufeli it was learned that there are plans for hydroelectric developments that will affect every valley and watercourse the team surveyed. These are part of the Turkish government's plan to generate more electricity and less carbon dioxide through promoting renewable-energy initiatives countrywide. While such initiatives are to be welcomed, the effect of

Within the Kaçkar region, the little tiger blue (*Tarucus balkanicus*) is found only in the hot, dry climate of the Çoruh watershed. Photograph by Evrim Karaçetin.

the projects on natural water cycles and on this mountainous landscape—and therefore on the area's local people and on its biodiversity—will be devastating.

While the places most directly impacted will be the valley bottoms and watercourses—sections of which are likely to become completely dry at certain times of year—the surrounding landscape will also be affected, as rivers are channelized to follow the contours of mountainsides, tunnels are dug to pipe water through mountains, generating stations are built, pylons are installed to carry electricity out of the region, and roads are built for construction and future maintenance. These will destroy areas of habitat over a much wider area and cause immediate butterfly population losses, but more insidious will be the fragmentation of the remaining populations and the resulting local isolation and slow but steady declines. For example, the large dam to be built on the Çoruh River at Yusufeli (part of a separate and already partly implemented large-scale hydroelectric scheme) will wipe out some populations of the endemic Hi blue, fragmenting and isolating those subpopulations that remain. Of course, since the plans for the dams and hydroelectric projects in the Kaçkar Mountains are not clear, their precise impact on butterflies is also unclear, but it is certain that butterfly populations will be negatively affected.

The authors had an unforgettable time in the field in 2008 and wanted to share with others what they had discovered. So, in 2009, DKM, building on the previous year's experience (and with funding from the Dutch government's BBI-Matra program), organized a butterfly-watching camp, bringing together enthusiasts and conservation experts to enjoy the Yusufeli area's butterflies. The camp also served as an example of responsible nature-based tourism. With everything organized through local people, it demonstrated the potential that such tourism has as a source of additional income. During the seven days of the camp the group of eighteen, comprising Turkish butterfly watchers and experts from the United States, Belgium, the Netherlands, and England, recorded a phenomenal 142 species, and proved that a camera, close-focusing binoculars, and patience are all that is needed to enjoy, photograph, and, if desired, study the finer differences between *eurypilus* and *argyrognomon*, *anteros* and *artaxerxes*, *corydonius* and *dorylas*. . . .

Looking forward, it is to be hoped that these efforts—both to assess the status of the butterflies and to help the people in the region see possibilities for active participation in conservation—will lead to many more people having the opportunity to enjoy the butterflies of the Kaçkar Mountains.

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Following Butterfly Conservation's sixth international symposium in Reading, UK, a petition was launched in opposition to the hydroelectric developments. To learn more, please visit www.savekackars.com.