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The impacts of European-financed small hydropower plants on pristine Balkan landscapes

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Cover photo: the intake of the Tearce 97 (Bistrica 97) hydropower plant deep in the Shar Mountain nominated Emerald site. Photo by Andrey Ralev

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Executive summary

The Balkans region is a European refuge of clean and wild rivers and lakes. But during the last fifteen years it has been under increased pressure from plans to build thousands of hydropower plants.[1] While most of the plans have not yet been realised, many of the plants built have been supported by European public money with banks such as the European Bank for Reconstruction and Development and European Investment Bank taking the lead. Hundreds of millions of euros of public money have been poured into hydropower infrastructure in the region.[2] The banks advertise these plants as green energy, while at least 24 projects supported by multilateral development banks 2005-2015 were either inside, on the boundaries of, or clearly impacting on, protected areas.[3]

While large greenfield plants have proved hard to build, small plants with their attractive feed-in tariffs have been built in large numbers, especially in Albania. This trend looks set to continue, although their contribution to overall electricity generation is small compared to the amount of damage they cause. Between 2001 and 2015, 57 large hydropower plants contributed 97 percent of hydropower generation in the Western Balkans vs. 387 small hydropower plants contributing 3 percent.[4]

In order to see the impacts of such projects in practice, in 2017 Bankwatch has undertaken site visits to 8 European-financed hydropower projects in Albania (2) Croatia (1), and Macedonia (5). Altogether we visited 12 diversion intakes and one run-of-the-river weir, all of them located in protected areas or in ecologically sensitive areas. In three cases (Tresonecka reka, Tearce 97-98, Rapuni 1-2) the plants are situated in Emerald zones, which means that they are future Natura 2000 sites, while Ilovac in Croatia is in the river Kupa Natura 2000 site.[5]

Only the Ilovac plant in Croatia went through a full EIA procedure and the so-called Appropriate Assessment of biodiversity impacts stipulated by Article 6.4 of the EU Habitats Directive. However even this case shows that being in the EU does not guarantee sound environmental assessment.

In summary we found all of the plants visited are in urgent need of increased impact monitoring as well as restoration measures. In most of the cases flagrant violations of national laws and international financial institutions' standards are visible.

In recent years, the banks have improved their lending policies. In 2016 the European Bank for Reconstruction and Development adopted hydropower lending guidelines.[6] Also, its 2014 Environmental

and Social Policy has a broad definition of protected areas, that includes some areas that do not have a national designation and recognises the importance of planned protected areas, not only those already existing. The European Investment Bank is currently developing its own hydropower lending guidelines that should improve sectoral lending scrutiny.

However the above cases show that further tightening of policies is urgently needed. They highlight three major flaws in the banks' lending policies.

First, the banks assume that diligent environmental studies will always prevent the construction of hydropower projects with extreme detrimental effects, and that for the rest they will devise effective mitigation measures.

This is very far from truth in the Balkans. Most of the hydropower projects are labelled as small - even though they can entail significant impacts and land-take - and do not undergo a full environmental impact assessment procedure at all. Due to their low electrical capacity they are automatically assigned as "low-impact". Even when it is done, the environmental impact assessment process is very rarely done according to the EU EIA Directive, and assessment of cumulative impacts is almost non-existent.[7] However, as this report shows, so-called small hydropower projects can actually have substantial impacts.

The second assumption is that the banks, understandably, are building relationships with the clients on the basis of goodwill, assuming that they will act according to national legislation and banks' standards rather than break them. But for companies that are operating in such a weak governance context, there is an incentive to break rules in order to maximise electricity generation and increase profits. For instance, in Albania, the client went ahead with redirecting the water from his project to another one further downstream, which led to the drying up of 4.3 km of river bed, although this was not in the project approved by the Bank.

The third assumption is that governance in the countries is strong enough to detect and sanction violations of the local legislation, in case the banks' clients break the rules. In the cases we describe here, this is generally not the case: blocked fish passes, illegally cut forest and little or no residual flow have not been adequately addressed by the 'national competent authorities'.

This situation calls for decisive action: banks should put an immediate halt to financing any hydropower development in protected areas in the Balkans, aligning with IUCN motion 26,[8] irrespective of whether they are existing or planned. Hydropower investments must also be avoided in Critical Habitats,[9] irrespective of their legal status.

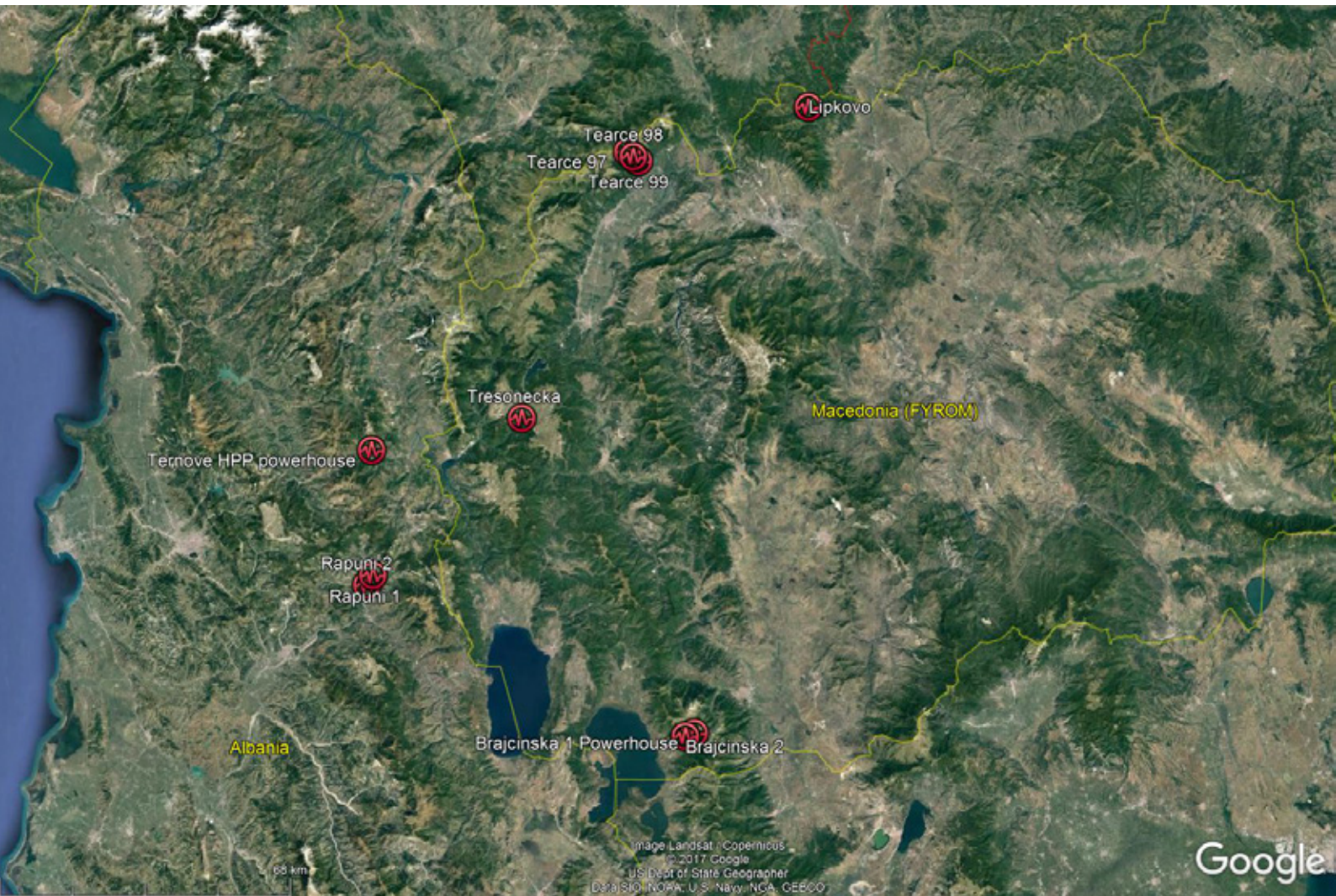
Because there are too many factors that are outside of the Banks' control, all plants in protected areas and critical habitats should be included in their exclusion lists.[10] Given the poor electricity:environmental impact ratio, banks should consider whether small hydropower projects on well-preserved watercourses make any sense at all.

In case such projects are nevertheless considered, banks need to avoid disproportionate damage to the environment by making sure that plants are part of coherent energy and river basin management strategies, and ensuring that environmental assessment is thoroughly carried out even for small projects. The European Commission should also play an enhanced role by assisting the countries to adopt and implement the EU Water Framework Directive and Birds and Habitats Directives in order to improve strategic river management in the region and help countries to avoid excessive pressure on rivers.

Figure 1: Overview of the plants visited

HPP	Country	Company	Investor country	Bank	Recommendation
Rapuni 1-2	Albania	C & S onstruction Energy shpk	Albania	EBRD	Urgent environmental flow restoration, restoration of the river banks, compensation to the affected communities
Ternove	Albania	Teodori 2003 shpk	Albania/Canada	EBRD	Urgent restoration measures (revegetation, sediment traps), renegotiation of water usage with local communities
Ilovac	Croatia	Tekonet d.o.o.	Croatia	EIB	Publishing monitoring reports; additional biodiversity research; avoid construction of further plants on the Kupa
Brajcinska reka 1	Macedonia	Mali hidroelektrani DOO	Macedonia	EBRD	Urgent natural flow restoration
Brajcinska reka 2	Macedonia	PCC HYDRO DOOEL	Germany	EBRD/KfW	Close monitoring of the impacts on endemic species eg. Prespa trout
Tresonecka reka	Macedonia	Hidro Enerdzi Group	Macedonia	EBRD	Urgent natural flow restoration
Lipkovo	Macedonia	SOL Hidropauer DOOEL	Italy	EIB	Unblocking the fish pass, cleaning up the pond, vegetation restoration
Tearce 97-99	Macedonia	SOL Hidropauer DOOEL	Italy	EIB	Environmental flow restoration, rehabilitation of the forests and riverbed

Figure 2: Locations of the plants visited (not pictured Ilovac, Croatia)



Overview

Since about 2005, there has been immense interest in building small hydropower plants in the Western Balkans,[11] a global biodiversity hotspot. Albania has the most active in this regard, awarding concessions for no less than 435 hydropower projects from 2007 to 2013.[12] While many of the concessions have not resulted in any construction so far, it is estimated that as of the end of 2016, there were as many as 387 hydropower plants of less than 10 MW in the region.[13] Not all of these are new, but many are.

Of those plants already built, many have been supported by European public money with banks such as the European Bank for Reconstruction and Development and European Investment Bank taking the lead.[14] The project sponsors and banks advertise these plants as green energy, while at least 24 projects supported by multilateral development banks between 2005-2015 were either inside, on the boundaries of, or clearly impacting on, protected areas.[15]

In spite of this alarming situation, the region's governments all plan to continue adding significant additional hydropower capacity, much of it from small plants. All the countries in the region have binding renewable energy targets to reach by 2020 under the Energy Community Treaty, and are heavily relying on hydropower to do so.[16] Figure 3 shows the expected percentage of hydropower in renewable electricity generation capacity by 2020 compared to other sources like solar and wind.

However, while serious impacts from small hydropower are becoming clear in the region, and more and more communities are resisting the construction of plants in their vicinity, governments have shown no sign of changing course.

As the European Commission and international financial institutions emphasise the importance of compliance with EU and bank standards when planning and implementing hydropower projects, EU-financed hydropower projects ought to be among the most environmentally appropriate ones in the region. We therefore decided to examine more closely several plants to see if this is the case.

In 2017 Bankwatch has undertaken site visits to 8 European-financed hydropower projects in Albania (2) Croatia (1), and Macedonia (5). Altogether we visited 12 diversion intakes and one run-of-the-river weir, all of them located in protected areas or in ecologically sensitive areas.

Figure 3: Percentage of renewable installed capacity in 2020 to meet the binding 2020 targets

Country	Hydropower	Wind	Biomass	Solar	Geothermal
Albania	96.47	1.25	0.21	2.08	0.00
BiH	89.37	9.00	1.36	0.27	0.00
Kosovo	79.00	14.80	5.20	1.00	0.00
Macedonia	88.82	6.25	1.75	3.18	0.00
Montenegro	81.50	13.80	4.00	0.70	0.00
Serbia	80.28	15.08	4.31	0.30	0.03

This report shows the results and provides recommendations for both immediate action to be taken for the plants already built, but also for future actions by the European Commission and international financial institutions.

Derivation hydropower plants

Small-capacity hydropower plants (usually below 10 MW)[17] are usually designed as so-called derivation schemes: the water is diverted from the river at an intake weir upstream and channelled through a pipe to the powerhouse containing the turbines downstream (see Figure 4). The height difference ("the head") is used to induce kinetic energy in the water that is then transformed into electricity. The water used is returned to the river only after the powerhouse, leaving a smaller amount in the river in the section before that (residual flow).

The majority of hydropower plants covered by the report are of this type, using either rivers or even lakes as a source of water. Only the Ilovac hydropower plant in Croatia is a run-of-the-river type plant. Here the diversion happens at the point where water is abstracted and it is suitable for rivers that have low "head" but a larger amount of water (Figure 5).

Figure 4: Pipes entering the powerhouse of a derivation plant. Author: Qurren

Figure 5: Ilovac run-of-the-river plant, source: TSREDCO Ltd.

What both of these schemes share is that they do not utilise high dams and do not create large reservoirs. In the perception of the hydropower proponents and financiers this translates into lower environmental impacts. However, the plants still disturb the natural flow of the river and the case studies in this report describe concrete impacts on riparian ecosystems as well on access to water by the adjacent communities.

Downplaying impacts in the planning phase

In all the countries covered by the report, small hydropower plants are rarely subject to a full and comprehensive environmental impact assessment (EIA). Using an approach allowed by the EU's EIA directive, hydropower projects that do not have a reservoir are put on the list in Annex II of the respective laws.[18] That means that the national authorities can decide whether an environmental impact assessment is needed. In some of the Balkan countries a shorter environmental study is required but not a full EIA. Sometimes controversial projects such as the Lengarica HPP in Albania are classified as Annex II projects, although located within protected areas (in this case a National Park).[19] Indeed only one project described in this report went through a full EIA.

We noted significant issues with the environmental studies described in the report, as the Albanian studies were impossible to obtain, and after repeated attempts we were unable to get the study for Brajcinska reka 1 in Macedonia. Only the studies for Brajcinska reka 2 (Macedonia) and Ilovac (Croatia) contained a more comprehensive - but not necessarily complete - overview of the local biodiversity, but with deficient evaluation of the impacts. Small hydropower plants are often built in cascades (ie. one after another on the same stream) in order to maximize energy production. In the respective environmental studies and EIAs, analysis of the cumulative impact of such cascades (Rapuni 1-2, Brajcinska reka 1-2 and Tearce 97-99) is either absent or downplayed.

Fish passes

All hydropower schemes in some way disturb the normal flow of materials, nutrients and organisms -

Figure 6: An almost dry fish pass at the Brajcinska reka 1 intake

the so-called longitudinal connectivity of the river. Fish passes are supposed to mitigate the impacts of weirs and intakes on fish migration. There are types of fish passes that are considered more eco-friendly for instance “close to nature” types.[20] Also there are widely used guidelines for fish passes,[21] however there is no clear consensus on the effectiveness of fish passes, and they remain to be assessed on a case by case basis.[22]

All the projects described in this report, save the Ternove project in Albania that is not built on a river, were equipped with fish passes. Their characteristics are described in the respective case studies.

However, even if perfectly designed, if the residual flow between the intake weir and powerhouse is not adequate, the fish passes are of no use.

Residual flow

Native aquatic and riparian organisms are adapted to natural variability in the flow at different times of the year. There is a consensus that ‘’minimum’’ flows are inadequate. The more current approaches mimic components of natural flow variability, taking into consideration the magnitude, frequency, timing, duration, rate of change and predictability of flow events.[23]

However in Albania, Croatia and Macedonia determining only the minimal flow is still practiced. Macedonian law does not even determine the methodology. In practice it is set as 10 percent of the multiannual flow.[24] In Albania, the minimum ecological flow for each natural water body is determined according to river basin management plans, but should not be less than Q355 (based on the daily averages from the hydrological study, which are not exceeded more than 355 days per year).[25] This means that on average the natural flow is lower than the Q355 value for only 10 days of the year. In practice, the minimal flow is often not determined or is plainly ignored by the operator (see case study on Rapuni 1-2). Croatia employs in practice the so-called MNQ method,[26] putting minimal annual average as a threshold for residual flow.

In most cases even minimal requirements are not being followed: growing evidence around the Balkans shows that operators are often putting the whole river into pipes.[27] The results of our monitoring visits are also alarming: in four of the seven relevant cases (Brajcinska reka 1, Tresonecka reka, Lipkovo and Rapuni 1-2) we identified low or no residual flow.

Ancillary infrastructure

The impacts of ancillary infrastructure such as access roads, transmission line, and tunnels are often neglected.[28] The impacts are under-reported in environmental impact studies and in any case limited to the construction phase impacts.

At all the plants we visited, the ancillary infrastructure was affecting the environment even in the operational phase, at the time of our visit: erosion was affecting the hillsides and threatening further deforestation (see for instance the case studies for Rapuni 1-2, Ternove and Lipkovo), materials from access roads had been dumped into the river or the woods (Ternove, Tearce 97-99, Brajcinska reka 1), fauna is likely to be being disturbed by increased traffic (Tresonecka reka), and sediment is being brought into a water body that was protected as a Monument of Nature (Ternove).

Impacts vs. benefits

Given these impacts, it is questionable how much the benefits of small hydropower projects outweigh the risks. The main benefit is production of electricity without significant CO2 emissions. However, on a global scale SHPPs contribute less than approximately 2 percent of total electricity generation. These

projects are located in more than 150 countries and are often concentrated in mountain regions[29] thus having a high potential to disrupt ecosystems that are generally more preserved. In the Western Balkans, between 2001 and 2015, 57 large hydropower plants contributed 97 percent of hydropower generation versus 387 small hydropower plants contributing just 3 per cent.[30]

Financial intermediaries

The report covers three projects (Lipkovo, Tearce 97-99 in Macedonia and Ilovac in Croatia) that were not directly financed by the European public banks, but instead the loans were extended via local banks, the Macedonian Bank for Development Promotion and Croatian Bank for Reconstruction and Development (known by its Croatian acronym HBOR).

This makes the projects hard to connect with their original financiers. The aforementioned projects were revealed as EIB projects to Bankwatch only in 2016 after several repeated attempts to request information about financial intermediary investments.

At the same time the use of intermediaries places the main responsibility for due diligence and information disclosure on the local banks. This has proved to be lowering the standards of the European banks. In research conducted by Bankwatch in January 2017, both of the intermediary banks refused to indicate where on their websites environmental studies are shared and even actively argued against such disclosure (in the response of HBOR).[31]

Need for further tightening of banks' lending policies

Given the growing scale of the problem, in recent years the banks have improved their lending policies. In 2016 the European Bank for Reconstruction and Development adopted hydropower lending guidelines.[32] Also, its 2014 Environmental and Social Policy has a broad definition of protected areas, that includes some areas that do not have a national designation and recognises the importance of planned protected areas, not only those already existing. The European Investment Bank is currently developing its own hydropower lending guidelines that should improve sectoral lending scrutiny.

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In case such projects are nevertheless considered, banks need to avoid disproportionate damage to the environment by making sure that plants are part of coherent energy and river basin management strategies, and ensuring that environmental assessment is thoroughly carried out even for small projects. The European Commission should also play an enhanced role by assisting the countries to adopt and implement the EU Water Framework Directive and Birds and Habitats Directives in order to improve strategic river management in the region and help countries to avoid excessive pressure on rivers.

Albania

Albania produces all of its domestic electricity from hydropower.[37] As of June 2017, 177 HPPs are in operation and licensed by the Energy Regulatory Entity (ERE); 43 HPPs are under construction and 364 HPPs have been planned by the Ministry of Energy.[38]

Hydropower projects are putting significant pressure on the environment. Albania still has pristine natural areas in comparison to the EU, with 30 per cent of European plant species and 42 per cent of European mammals found there.[39] Yet it has only 16 per cent of its territory covered by protected areas and so far the fragile governance system has been unable to balance the risks of development with environmental protection. In 2017 a new Law on Protected Areas finally forbid the construction of hydropower plants in National Parks,[40] but this move comes too late for those plants such as Rapuni, below. It is also of little comfort in cases like the planned plants on the Vjosa river where the area is not legally protected.

Small-scale hydropower projects often do not pass through a comprehensive Environmental Impact Assessments (EIAs) at all, which in a fragile governance context leads to outright destruction of the environment. The implementation of the Aarhus Convention was enhanced with the 2014 Law on the Right to Information and 2015 Law on Notification and Public Consultation. But significant improvements are still needed: a recent court decision shows that public consultations for a hydropower plant were entirely faked.[41] Enforcement was at least in the short term weakened by the 2015 decentralisation, where some competences of centrally-run agencies were moved to local governments. This caused gaps in the enforcement of environmental legislation, like in forestry management, previously under the Forestry Inspectorate, and now transferred to municipalities. It is therefore the municipalities' role to report infringements of the Law on Forests, which they lack capacity to do properly.

There is an almost complete lack of monitoring and enforcement by the Albanian authorities. In both projects that we visited, the environmental destruction was connected with social impacts as the rivers had also been used for irrigation purposes. Residual flows are not enforced. Ancillary infrastructure such as access roads brings further destruction to pristine environments.

Recommendations

- The EBRD and other international institutions should stop considering any investment in hydropower schemes before investing in governance (e.g. technical assistance for capacity building in environmental permitting and monitoring and anti-corruption measures) that would enable better control of permitting as well as monitoring.
- For the existing plants the EBRD and other international institutions should ensure better communication with local communities to enable locals to voice their grievances.
- Any strategic planning should establish no-go zones (e.g at least in the areas of IUCN Category I-VI,[42] as well as internationally recognised areas such as Important Plant Areas).
- While reviewing its Environmental and Social Policy, the EBRD should rethink its approach to Category B projects, increasing the level of information disclosure as well as environmental and social scrutiny.
- The EBRD together with the European Commission could play an enhanced role by assisting the countries to adopt and implement the EU Water Framework Directive and Birds and Habitats Directives and should consider whether to cease investments in greenfield hydropower projects until the Nature Directives are implemented.

Rapuni 1 & 2

The Rapuni 1 & 2 hydropower plants are situated on the Qarrishtë river[43] that flows entirely through the Shebenik-Jabllanicë National Park. The area is under extreme pressure from hydropower development: 45 concessions for hydropower plants have been awarded within the borders of the National Park.[44]

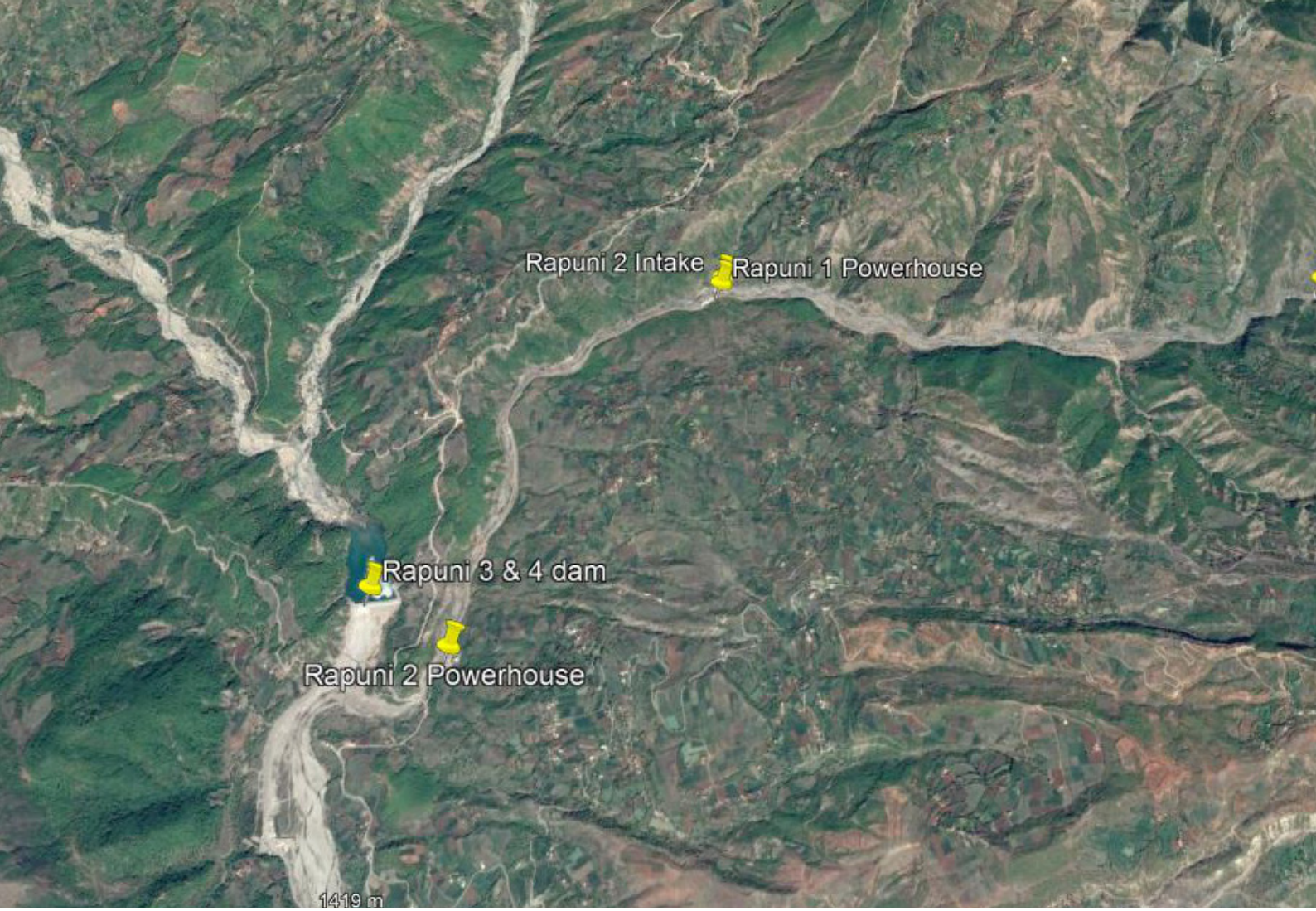
Rapuni 1 & 2 have been built as a cascade, starting with the intake of Rapuni 1, followed by the Rapuni 1 powerhouse and the Rapuni 2 intake, which are joined, and ending with Rapuni 2 powerhouse close to the confluence with the Rapuni river. However, the impact of the project does not end there – a concrete tunnel diverts all the tailwater from the Rapuni 2 powerhouse to another project – Rapuni 3 & 4. Together they dry up much of the riverbed all the way to Librazhd.

The draft National Park management plan identifies hydropower as the main threat to water resources.[45] The same document outlines that within the Park, fourteen fish species have been recorded in the Shkumbini, Rrapun, Qarrishte and Bushtrice rivers, including five species that are on the IUCN Red List: *Anguilla anguilla* (Critically Endangered), *Oxynoemacheilus pindus* (Vulnerable), *Barbus meridionalis* and *Rutilus rubilio* (both Near Threatened), and *Salmo trutta macrostigma* (Data Deficient).[46]

- *Promoter & operator: C & S Construction Energy sh.p.k.*
- *Location: near Librazhd, Elbasan County*
- *In operation since: 2013*
- *Intake Rapuni 1 41.239118, 20.362062 Powerhouse Rapuni 1 41.239904, 20.320364*
- *Intake Rapuni 2 41.239904, 20.320364 Powerhouse Rapuni 2 41.219477, 20.303962*
- *Installed capacity: Rapuni 1: 4.46 MW Rapuni 2: 3.78 MW*
- *Financing: EUR 7.2 million loan from the EBRD in 2011*
- *Protected areas: Shebenik-Jabllanicë National Park, Nominated Emerald site*

The residual water flow is inadequate and not determined in advance; the fish passes are problematic. And finally, the cumulative impacts are disastrous: making all the tailwater from the Rapuni 2 go via a tunnel to Rapuni 3 & 4 leaves almost no water below the Rapuni 2 powerhouse, which has contributing to drying up the riverbed for a length of 4.3 km.

Bankwatch visited the vicinity of the plants in June 2017.[47] The team, joined by hydro-biologists, visited all the powerhouses and intakes in the cascade and conducted interviews with affected communities. After we published our initial findings,[48] the EBRD sent a monitoring mission, confirming some of our observations.[49]



Although built in a biodiverse and sensitive area, no full Environmental Impact Assessment procedure for this project was carried out. Allegedly, a "Summary Report of Environmental Impact Assessment" was submitted to the Ministry of Environment, Forestry and Water Administration for approval. A detailed Environment Management Plan as well as Environmental Mitigation Plan was again, allegedly, prepared and submitted with the EIA Report. Environment Permit No. 440 was issued on June 9, 2008.[50] However, an information request submitted to the National Environment Agency of Albania resulted in an answer that the Summary report is not available.[51] In response to a request to the EBRD, the bank stated that the Rapuni project was categorised B and hence was not subject to environmental and social impact assessment under EBRD requirements.[52]

In the course of the field visit during the dry season in June 2017, our visual estimate was that the average residual flow in Qarrishtë river was 0.05-0.1 m^3/s (50-100l/s) which is 2 percent of the river's average annual flow of 5.95 m^3/s.[53] The local organisations report that in recent years the river has even dried up completely.[54] It is of utmost concern that the installed capacity is determined according to return on investment and not the ecological and hydrological assessment.[55] After the July 2017 monitoring mission, the EBRD confirmed that the residual flow is inadequate and estimated that it should be at least 0.3 m^3/s, but offered no calculation on which such flow is determined.[56] A request by the EBRD to restore adequate environmental flow took effect immediately after its monitoring visit.[57]

The fish pass constructed on the intake of Rapuni 2 lacks water and has an almost dry downstream entrance and a water gate at the upstream exit in a halfway down position. Also, at the time of the visit a more attractive flow compared to the tailwater released from the fish pass was discharged further below. The Rapuni 1 fish pass is better designed, and has more water. But given the deficient residual flow regime, the fish passes are useless, and would only to have some effect if there was more water below the intakes.

Figure 8 Fish pass at Rapuni 1 intake

Figure 9 Fish pass at Rapuni 2 intake

The access roads and other construction works on the left bank of the river have caused erosion. The company has tried to partially rehabilitate the riparian vegetation destroyed by the construction works and lack of water, but has done so by planting Black Locust (*Robinia pseudoacacia*) that is an invasive species in the context of the National Park's native ecosystem. The EBRD's team confirmed the erosion and ordered "an assessment by suitably qualified engineers... to review stability of offtake structures and any improvements that may be required."[58]

Cumulative impacts and conflicts about water usage rights

The C & S Construction Energy company has made efforts to communicate with nearby communities. According to the workers interviewed on the site, the company has built and maintained a 3 kilometre rural road in the area. The company has also made efforts to repair irrigation channels next to the Rapuni 2 powerhouse and to finance programmes for socially vulnerable groups.

However, at the same time, the company has negotiated a water sharing agreement with the operator of the adjacent Rapuni 3 & 4 hydropower plant. C & S Energy, the Rapuni 3 & 4 project company, is mainly owned by the Albanian Orthodox Church, but is also 2 percent owned by C & S Construction,[59] the same company that owns the Rapuni 1 & 2 company. At its founding, C & S Energy, was actually majority controlled by the companies C & S Construction and Ferar sh.p.k owned by Arjan and Ferid Cukaj.[60]

All the tailwater from the Rapuni 2 powerplant is channelled towards Rapuni 3 & 4 scheme. Combined with the fact that the Rapuni 3 & 4 dam does not have fish passes and does not leave any residual flow[61]

this creates serious environmental and social impacts on the 4.3 km stretch up to the confluence of the Rapuni with the Shkumbini. The only flow left is the residual flow that has been released on the Rapuni 1 and 2 intakes, that is as it is already noted, not sufficient for the Qarrishtë, let alone for the parent river, Rapuni.

The field visit documented at least three conflicts with community water rights, which are a consequence of the lack of water in the Rapuni river: a cornflour mill owned by the Shkurti family close to the confluence of the Qarrishtë with the Rapuni, a hamlet of 5 houses close to the Rapuni 3 dam, and the village of Togez that is more downstream, overall affecting hundreds of households.[62] Only the first case is directly attributable to connecting Rapuni 2 with Rapuni 3 & 4. The EBRD has acknowledged the problem and has recommended the immediate release of more water, so that mill can resume operation, as well as compensation to the owner, without specifying the process or the amount. As of 15 November 2017, neither of these two commitments was fulfilled.[63]

It is worth noting that the Rapuni 3 & 4 project, that operates illegally by not releasing residual flow into the river bed, although not financed by the EBRD, is financed by the National Bank of Greece (NBG),[64] the bank owned by the Hellenic Financial Stability Fund. Apart from breaching ecological flow standards, the project has damaged the houses in the village of Togez without proper compensation.[65] It is also on the boundary of the Kuturman natural reserve, a nominated Emerald site.

What went wrong

The EBRD's monitoring carried out in previous years did not identify the problem with the corn flour mill. It did identify issues with the fish passes.[66] Also, it is not clear if the Bank has noticed the tunnel between Rapuni 2 and Rapuni 3 & 4. But it is certain that such a connection was not a part of the original project that was financed by the EBRD.[67]

The fact that the EBRD did not require an EIA according to EBRD standards - although the project is in a National Park - is also worrisome and might have led to some of the issues such as insufficient residual flow. There is therefore also no assessment of cumulative impacts with Rapuni 3 & 4, although at the time when the loan was awarded (2011) the concession for Rapuni 3 & 4 had already been signed.[68]

This example shows how operating in a weak governance context can expose the bank to reputational risk. Even if the Bank didn't have any control over whether the two projects would be connected, it cannot ignore the fact that its client significantly changed the project design and it has ended up de facto financing part of the same scheme that is operating illegally and extremely damaging to the environment and local communities.

Figure 10: Tunnel taking tailwater to Rapuni 3 & 4

Figure 11: Rapuni 3 & 4 dam leaves no residual flow

Recommendations

- Immediately ensure provisional residual flow of 300 l/s. Carry out research to establish a proper environmental flow that will be sufficient to sustain all ecological functions.
- Compensate the miller for the losses so far.
- Establish a link with the Regional Directorate for Protected Areas to coordinate mitigation and restoration measures in a manner that will not be detrimental to the ecological integrity of the National Park (e.g. not using invasive species for restoration measures).
- Commission research on the functionality of the fish-passes on the Rapuni 1 & 2 intakes and take measures to improve them.
- EIA should be obligatory even for smaller projects, in particular in biodiversity rich and protected areas.

Ternove

- *Promoter & operator: Teodori 2003 shpk*
- *In operation since: 2016*
- *Location: near Bulqizë, Dibër County*
- *Intake: 41.457373, 20.302736*
- *Powerhouse: 41.496254, 20.316749*
- *Installed capacity: 8.385 MW*
- *Loan: EUR 6 million from the EBRD in 2012*
- *Protected areas: Liqeni i Zi (Martanesh) Natural Monument*

The project is causing serious erosion and deforestation. It also endangers a glacial lake designated as a national nature monument. It was also not adequately consulted with the local community, which blames the facility for a lack of water for irrigation. This caused tension and violence in 2014, 2015 and 2016.

The Ternove project has been developed as a joint venture between Canadian and Albanian capital. The companies claim to be implementing good ecological practices.[69]

According to the company that designed the project, it includes 23 km of derivation channels, increasing the height of several existing dams up to 10 m, reconstruction of dams with a height of 40 m, design of 3 hydraulic tunnels, 5 km of penstock with diameter up to 700 mm and maximum head 1000 m, about 30 km of access roads, about 10 km of power supply line and other temporary works.[70] It is a major infrastructure project, yet it wasn't subject to a full EIA within the EBRD approval process.[71]

The project differs from usual derivation schemes: instead of diverting water from a river, Ternove HPP draws water from a system of lakes on the top of the Maja e Gjatë mountain close to Bulqizë, Diber County. The intake is located at the glacial Black Lake (Liqeni e Zi), that is protected as a natural monument.[72] To increase the capacity of the lake, water is drawn to the Black Lake from at least one other natural lake – Liqeni i Bardhë (also known as Liqeni i Bardhe i Ternoves). To the best of our knowledge, water is also currently being brought or planned to be channelled from Liqeni i Bardhë (also known as Liqeni i Bardhe i Valikardhes) and Liqeni i Sopë (Sopa lake).[73] The penstock runs 5 km down to the powerhouse, gathering momentum by using a height difference of almost one kilometer.

The Black lake was previously used for irrigation. Because the local communities were not properly consulted, the project created a rift, with some of the villagers turning to protests and alleged violence.[74] The last noted conflicts were in 2016 around the Sopa lake, where the company allegedly started works without the proper permits.[75] The Sopa lake is also used for irrigation as well as for the Koka 1 and 2 hydropower plants.

Bankwatch visited the vicinity of the plant in June 2017[76] and documented several issues with the plant's environmental as well as social performance. After we published our findings,[77] the EBRD sent a monitoring mission, confirming some of Bankwatch's conclusions.[78]

The field visit identified major issues with erosion and deforestation. The whole penstock runs above

Figure 12: A sign for the Liqeni i Zi natural monument (Photo: Bujar Karoshi)

ground and is surrounded by eroded hillsides, mainly consisting of clay soil. The central section of the pipeline in particular is affected by erosion, to the extent that it seems there is a risk of landslides.

Deforestation has resulted from the excavation work carried out to make space for the penstock. The excavation for the pipeline foundations, access roads and electricity lines also removed tree and vegetation cover. The company was fined several times for cutting trees without permission.[79] The status of these infringements is not clear, and there was no feedback to the Bulqizë office of the State Inspectorate of Environment and Forestry about the status of the fine.[80] The area is known for its pristine beech forests[81] that sustain a population of brown bears[82] as well as different endemic plant species.[83]

Poor construction practices continue in the area of the intake: below the access road leading from the Black Lake (Liqeni i Zi) to Liqeni i Bardhë, excavated rocks could be seen simply dumped in the woods. The same road is followed by a feeder channel that brings sediment from Liqeni i Bardhë into Liqeni i Zi.

The EBRD's consultants visited the area in July 2017. The monitoring report is not public but the EBRD has shared some of the main points with Bankwatch. The main findings confirmed that the company needs to reforest and rehabilitate the area including the area around Fusha e Zogut lake and that there is a risk of sediment inflow so that sediment traps need to be built. The company's deadline to reforest the area is by the end of 2018 and to build the sediment traps by the end of 2017.[84]


Figure 14: Excavated rocks discarded in the woods


Figure 15: Feeder channel bringing sediment into Liqeni i Zi

Figure 13: Map of the project, the blue lines signifying the feeder channels and the red line the penstock

Ternove HPP is built above a group of villages stretching from Bulqizë eastwards, that have been using water from the Black Lake for irrigation since the 1970s. The village of Strikëan obtains water from Fusha e Zogut but the village of Valikardhë also gets it also from streams just below the lake. The project company was involved in building the Fusha e Zogut reservoir, the purpose of which appears to be to compensate for the lack of water for irrigation.[85]

In 2016 the EBRD informed Bankwatch that it had conducted an on-site investigation into concerns about the project received in a letter from an affected citizen. The bank found nothing to substantiate the allegations.[86]

However, during our visit in June 2017 the villagers interviewed were still complaining about the lack of water for irrigation. Some of them contacted us after the field visits to repeat their grievances, not being aware that the EBRD had sent a monitoring mission.[87] The problems with irrigation are for sure partially caused by the poor state of the irrigation infrastructure, and there has been a dispute about maintenance between the company and the municipal authority. This was also the reason for conflicts that erupted in 2014 in the (former) Zerqan commune[88] as well as the already-mentioned conflicts with the Martanesh community in 2015 and 2016.

The most recent EBRD monitoring mission discovered that that the company has not established a grievance mechanism. This is another indication of the poor performance of Teodori 2003 in building relationships with the local community.

What went wrong

The EBRD assigned this as an environmental and social category B project. This means that it was under less scrutiny about its potential impacts than a category A project would have been. This categorisation is questionable from the point of view of the complexity of the project as well as the status of the Black Lake as a Monument of Nature.

In addition, less information about monitoring is available, as according to the EBRD "per EBRD's Public Information Policy, the Bank does not disclose the full ESAPs (Environmental And Social Action Plans) on category B-projects as these often contain commercially sensitive information".[89]

Prior to commencing the works, the project promoter Teodori 2003 sh.p.k did not consult the local population despite the fact that the hydropower scheme potentially limits the community's access to water. Such steps contradict the environmental and social requirements of the EBRD.

Recommendations

- The EBRD should release all environmental and social monitoring reports and action plans related to Ternove HPP, excluding the commercially sensitive information but including information that is relevant to the environmental and social performance of the project.
- The EBRD should release all the relevant project documents and maps that could publicly prove the lack of any link between irrigation issues and the hydropower scheme.
- The EBRD should ensure that all the obligations taken on by the company regarding reforestation and mitigation of the sediment inflow are respected.
- The company should immediately start a conversation with the local community to ease the tensions and consider co-investing in the irrigation infrastructure together with the municipality.

Figure 16: A section cleared for the access road and electricity poles

Figure 17: Erosion around the penstock

Croatia

Croatia generates more than half of its electricity from hydropower. This varies by year according to hydrology but in 2015 and 2016 represented 56-60 percent of generation.[90] Most of the plants were built when Croatia was part of Yugoslavia, but in the last 10-15 years numerous concessions have been distributed for small hydropower plants. Most of them have not been constructed and since Croatia has entered the EU it will now be more difficult to do so due to stricter nature protection standards as well as bad experiences with plants built in recent years.

Since Croatia joined the EU in 2013, more than one third of its territory has been covered by the Natura 2000 network, reflecting the country's rich biodiversity. According to the European Environmental Agency, Croatia is one of the top three countries in Europe for plant diversity, and almost half of all bird species in Europe can be found within Croatia's territory.[91]

The creation of the Natura 2000 network and the adoption of the EU's Birds and Habitats Directives means that not only an environmental impact assessment process has to be carried out for many hydropower projects, but also a so-called Appropriate Assessment has to be carried out for plans or projects which are likely to have an impact on Natura habitats and species. The results of the assessment are binding and national authorities may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned. There are very limited exceptions, based on overriding public interest.[92]

Implementation and enforcement of environmental legislation in Croatia remains far from perfect. However EU accession has provided a powerful impetus for improvement and the situation in Croatia is significantly more advanced compared to other countries in the region.

Ilovac, Croatia

Ilovac hydropower plant, which is situated about 5 km upstream from the town of Ozalj, started operating in 2015. It is owned by Tekonet d.o.o., which otherwise deals with telecommunications systems.[97] The plant was built at the site of a pre-existing weir, which was presumably assumed to reduce its impact, however it was completely reconstructed and its height increased by more than two metres. A 35-metre section of the weir has been removed and replaced with a rubber dam 3.4 metres high in order to better control the water flow.[98] Water flows through the turbines and over the dam.

Another hydropower plant has existed in Ozalj since 1908, and Tekonet also plans another plant – Brodarci – downstream from the town, so cumulative impacts are a crucial issue.

- *Promoter & operator: Tekonet d.o.o.*
- *Location: River Kupa near Ozalj, Croatia*
- *In operation since: 2015*[93]
- *Co-ordinates: 45.632203, 15.453048*
- *Installed capacity: 1.4 MW*
- *Loan: around EUR 4 million from the EIB, via the Croatian Bank for Reconstruction and Development (HBOR), plus financing from Zagrebačka banka (Unicredit).*[94]
- *Protected areas: River Kupa Natura 2000 area*

New research highlights that the environmental assessment for the plant may have missed the presence of a new fish species, Alburnus sava[95] *in the Ozalj-Kamanje stretch of the river Kupa.*[96]

The Environmental Impact Assessment (EIA) for the Ilovac plant was carried out according to the 2007 Environmental Act. The full version of the EIA is not available online but the non-technical summary makes it clear that the EIA included a section on the impacts of the plant on the future River Kupa Natura 2000 area, at that time part of the Croatian Ecological Network. According to research carried out in 2009 upstream and downstream of the pre-existing weir and cited in the EIA, 17 species of fish were caught, of which three were endemic. At the time, no Salmonidae fish were caught but older data and information from local anglers suggests that Danube Salmon (*Hucho Hucho*) and Brown Trout (*Salmo trutta*) have been caught in the area quite often.[99]

The River Kupa along the Croatian-Slovenian border is one of the most important habitats for the Danube Salmon (*Hucho Hucho*), which is endemic to the Danube catchment and is classified by the IUCN as endangered.[100] It is protected by the Bern Convention and the EU Habitats Directive, and is a key indicator for achieving the goals of the EU's Water Framework Directive. A study[101] on its presence in the Balkans found *Hucho Hucho* along 1822 kilometres of 43 rivers in Slovenia, Croatia, Bosnia-Herzegovina, Serbia and Montenegro. Of these, the River Kupa was found to be one of the healthiest and largest habitats.

Figure 18: Ilovac dam, Croatia

However, in the Balkan region, no less than 93 hydropower plants were found to be planned in *Hucho Hucho* habitats, which could endanger at least 60-70% of the Balkan *Hucho Hucho* population, equal to 35-40% of the global population.

Considering the importance of *Hucho Hucho* it is of concern that no more research was done to attempt to establish whether it was present in the Ilovac area or not.

The English language "summary of the summary" of the EIA[102] provided to Bankwatch in February 2016 by the EIB in response to an information request brushes over this issue completely and mentions only one species – *Chondrostoma nasus* – as a migrating species. For other species, it is only mentioned that there are 17 of them and that they do not migrate, so that they would not be harmed by the construction. However, this is not necessarily true, as *Hucho Hucho* migrate upstream in order to spawn,[103] although the distances in question are disputed.[104]

Another major issue with the EIA is the lack of in-depth assessment of the cumulative impacts of Ilovac SHPP together with the existing Ozalj plant and the planned Brodarci plant. The EIA concludes that "Ilovac SHPP does not have cumulative impacts with other existing and planned installations" (our translation).[105] That this is obviously not true was shown later in the Appropriate Assessment for Brodarci hydropower plant,[106] which states that if the Ilovac plant and the Brodarci plant are both built –" also taking into account the existing Ozalj hydropower plant and the already urbanised area downstream in Karlovac – the cumulative impact will be significant, and as many as 50 percent of the ichthyofauna species in that stretch of the river may disappear. (p.66-67). It is not clear why this was not picked up in the Ilovac assessment.

In spite of these and other deficiencies, a decision to accept the EIA was issued in 2010.[107,108] The EIA approval contained a list of mitigation measures to be carried out at different stages of the project's construction and operation, including the construction of a fish pass.

What is not mentioned in either the EIA non-technical summary or the EIA approval is that fish passes have not been proven effective in the case of Danube Salmon.[109]

In addition, field research carried out at Ozalj and Kamanje on the River Kupa, the results of which were published in October 2017, established the presence of Alburnus sava, the Balkan shemaya, in parts of the river Kupa upstream and downstream from the site of the Ilovac plant.[110] A paper distinguishing Alburnus sava as a new and separate species was published only in August 2017,[111] and it is therefore unclear what kind of impacts the hydropower plant is having on it.

What went wrong

The main issues seem to be that:

- The field research on biodiversity for the environmental impact assessment was not done carefully enough. It was not able to establish whether this part of the river was used by the Danube Salmon and it failed to pick up the presence of Alburnus sava.
- The cumulative impact of the Ilovac and Brodarci hydropower plants together with the existing Ozalj hydropower plant and other planned flood protection measures was not adequately assessed.
- As a result, the Decision to approve the EIA and Appropriate Assessment were not based on complete information. As a result they may have proposed mitigation measures which would be insufficient to serve their stated purpose.
- It is not clear whether the European Investment Bank ever received more than an English "summary of a summary" of the EIA, which is only just over two pages long. If it did not, this is completely insufficient to make any kind of assessment of the project's environmental impacts.

Recommendations

- The monitoring reports prescribed by the EIA approval decision need to be published and if necessary monitoring should be stepped up. Especially the efficacy of the fish pass needs to be examined.
- Additional research needs to be carried out on the remaining biodiversity up and downstream from Ilovac to better understand whether adjustments can still be made to the project to minimise its impacts.
- The Brodarci plant should not be built. In 2016 the new draft Karlovac County Spatial Plan and the accompanying Strategic Environmental Assessment (SEA) concluded that locations on the rivers Korana and Mrežnica are not suitable for the construction of hydropower plants.[112] The SEA also analysed the current pressures on the rivers in Karlovac county and found that the river Dobra, where the Goljak hydropower plant was built decades ago, and the Lešće plant was added in 2010, have much worse water quality than those where there are no such facilities (Korana, Mrežnica). This should also trigger reconsideration of other sites identified for hydropower construction, including Brodarci, as they were chosen relatively long ago, on the basis of lower standards and old data and research which did not take account of all necessary factors.

Macedonia

Macedonia currently has 9 larger[113] and 73 small hydropower plants.[114] In 2015 Bankwatch's research discovered that the highest number of projects financed by the International Financial Institutions in protected areas is in Macedonia, including in the Mavrovo National Park.[115]

The EIA process in Macedonia is inadequately implemented.[116] Moreover most hydropower plants are not subject to a full Environmental Impact Assessment, but only need a so-called environmental "Elaborat" study to obtain an environmental permit. These documents have a relatively similar structure as the EIA prescribed by the EIA Directive but significantly less detail.

Anecdotal evidence suggests that monitoring of hydropower plants is weak with a complete lack of water as a common grievance voiced by local communities.[117]

Another major issue is determination of residual flow, calculated as 10 percent of the average annual flow. That kind of flow determination does not account for seasonal changes in the flow.

All the plants described have been built in areas of high biodiversity value. The upper stretches (ie. above the main intake) still have high biodiversity value and should be preserved from further hydropower development. None of the plants underwent a full EIA process. The fish passes need monitoring. Critical species are endangered. There is a suspicion that residual flows are not respected. Poor construction practices have been employed.

Specific recommendations from Macedonia

- Avoid constructing hydropower plants in protected areas
- Employ stronger residual flow requirements. Make the flow determination participatory and holistic.
- Carry out regular monitoring of the fish passes and automatically publish data on the residual flow at each plant online.

- Due to the low quality of the environmental Elaborat studies, all hydropower plants should undergo a full Environmental Impact Assessment, at least until legislation is in place that would regulate an Appropriate Assessment process.

Brajcinska reka 1 & 2

Although owned by different companies, the Brajcinska reka 1 & 2 hydropower plants (also known as Brajcino 1 and 2) are connected by the fact that both projects received loans from the European Bank for Reconstruction and Development, in 2010 and 2011 respectively. Moreover, Brajcinska reka 2 has an equity share owned by DEG, a subsidiary of KfW, the German state development bank. What they also share is that they are both located in an extremely sensitive area: a habitat of the endemic Prespa Trout (*Salmo peristericus*).

Brajcinska river has a catchment area of 78 km^2. The length of the main stream is 15.8 km and its mean annual discharge is 0.927 m^3/sec, thus it is the biggest of the rivers containing the Prespa trout.

The building of Brajcinska reka 1 contradicts the purpose of the Law on Nature Protection of Macedonia.[118] It was constructed in the Pelister National Park which had been expanded to include part of the upper Brajcino river valley. The same law states that waters and water habitats, including springs, streams and rivers represent natural wealth and are to be preserved in their natural state. It is not understandable how fishing was banned[119] in all tributaries of Brajcinska river but construction of hydropower plants was allowed.

The building of Brajcinska reka 1 and Brajcinska reka 2 has led to significant impacts to the most important river system for the species. The Brajcinska river and its tributary Kriva Kobila, were completely dry between the Brajcinska 1 intakes and midway to the powerhouse in September 2017. In 2006-2007 these stretches were among the most important Prespa Trout habitats with 28 and 43 trout per 100 m of stream respectively.[120] Between the Brajcinska reka 2 intakes and powerhouse the situation was better with enough water in the river in September 2017 and the presence of Prespa trout, stone crayfish (*Austropotamobius torrentium*) and otter (*Lutra lutra*). Nevertheless the trout population's status doesn't seem healthy as considerably fewer individuals were registered than above the intakes of Brajcinska reka 1.

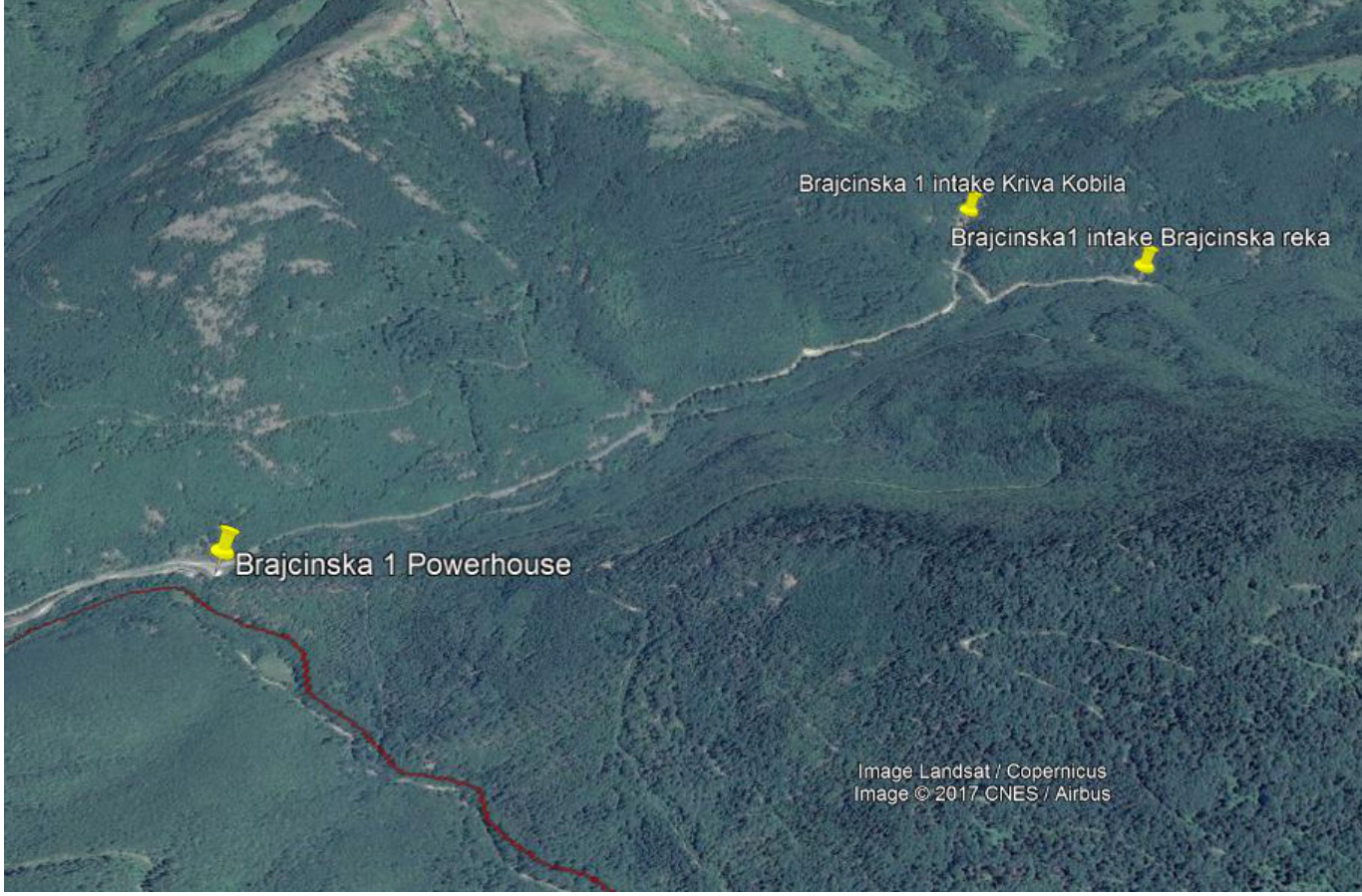
The presence of Salmo peristericus is acknowledged in the environmental Elaborat study carried out for Brajcinska reka 2. However, the likely cumulative impacts were downplayed[121] and it was assumed that the construction of a fish pass would mitigate the issue.[122] According to the Prespa trout species action plan,[123] "the longer two-way stretches of stream are (where trout can migrate both ways - downstream and upstream), the better will be the health and the viability of the trout population, while a highly fragmented habitat will result in the isolation of populations, and reduce their size and viability". Even with fish passes (effective only for upstream migration) the intakes are an additional obstacle for fish migration.

No more hydropower plants should be allowed in this region to avoid further fragmentation of the habitats.

Brajcinska reka 1

Brajcinska reka 1 is operated by the biggest investor in the small hydropower sector in Macedonia, Mali Hidroelektrani DOO. This company is 50 percent owned by Feroinvest doo, that is in turn 80 percent owned by the current Vice Prime Minister of Macedonia, Kocho Angjusev.

Brajcinska reka 1 is diversion hydropower plant, using two intakes, one located at Kriva Kobila and one



on the main, Brajcinska river. The pipes, following the access road, are approximately 2500 m long including the section that goes to the Kriva Kobila intake.

During the field visit in September 2017, in the dry season, the team documented a residual flow of only 0.001 m^3/s (1 litre per second) on both intakes, which translates into a completely dry river bed within a few dozen metres from the intake on the Brajcinska river, and around 150 m from the intake on the Kriva Kobila river. The residual flow set by the water permit is 0.0201 m^3/s for Kriva Kobila, while for the intake on Brajcinska it is 0.0355 m^3/s.[124] All the aquatic life in an estimated stretch of 1.5 km of Brajcinska and Kriva Kobila rivers has been destroyed. After a few hundred metres from the former confluence with the Kriva Kobila, the Brajcinska river starts to recover, most probably because of the streams that join the main waterway from the sides of the valley. Yet the hydropower plant is featured in an EBRD promotional YouTube video as an example of a "green investment".[125]

Brajcinska reka 1
Also known as: Brajcino 1

- *Promoter & operator: Mali hidroelektrani DOO Skopje (owned by Feroinvest doo)*
- *Location: Southwest of Macedonia, near the village of Brajcino, Resen municipality*
- *In operation since: 2013*
- *Intake on the Brajcinska river: 40.920550, 21.219973*
- *Intake on the Kriva Kobila river: 40.924391, 21.216094*
- *Powerhouse: 40.917834, 21.195217*
- *Installed capacity: 0.704 MW*
- *Loan: European Bank for Reconstruction and Development in 2010, EUR 6 million for a bundle of HPPs*
- *Protected areas: Pelister National Park, Important Plant Area, Prime Butterfly Area*

The field visit uncovered the illegal practice of not releasing residual flow from the intakes at both Kriva Kobila and Brajcinska river. Critical habitat of Prespa trout has been degraded.

Even if the residual flow was adequate, the biocorridor on both intakes is disrupted. On the Brajcinska river intake,[126] close examination shows the fish pass upstream entrance is inadequate, while the upstream exit is blocked. Although the fish pass dimensions are mostly within the recommended limits, except for the depth, there is no bottom substrate in the pools. On the Kriva Kobila river intake,[127] the fish pass upstream entrance is inappropriate, and the upstream exit is again blocked. The fish pass dimensions are in line with the most commonly used guidelines. Bottom substrate is present in the pools.

Figure 20: Images clockwise from top left: pristine river above the intake on Kriva Kobila; dry river bed below the intake on Kriva Kobila; dry river below the intake on Brajcinska; pristine river above the intake on Brajcinska

Below the intake, tree branches and trunks, possibly remains from the access road construction, have been dumped in the riverbed. This again means that even if there was more residual flow released in the riverbed, the materials would block the natural migration of fish and other aquatic organisms. There is also a piece of concrete that blocks the Kriva Kobila just above the former confluence with the Brajcinska.

The fact that the habitats below the intakes are seriously damaged, only looks worse when compared to the section of the rivers above both intakes. According to our ecological survey,[128] the watercourses are inhabited by macroinvertebrates typical for clean, fast flowing and well oxygenated streams. Further, the Balkan goldenring dragonfly *Cordulegaster heros*, a species of Community Interest, was recorded in Kriva Kobila above the intake. The goldenring dragonfly is listed in Annex II of the Habitats Directive, and categorised as Near Threatened on the IUCN Red List. Trout was observed in the pools above the Kriva Kobila intake, most probably the endemic Prespa trout.

It is worth noting that even after repeated requests the environmental study for this hydropower plant was not made available by the competent authorities. The only publicly available document is the project design document for the Clean Development Mechanism that doesn't mention any issues with biodiversity or communities, and even falsely claims that "no rare and endangered aquatic species were found in the construction area."[129] That means that the project obtained a rubber stamp as a "green" power source based on ignoring, at minimum, the presence of the endemic Prespa trout in the area, but also the Balkan goldenring dragonfly and potentially other species.

The access roads from the powerhouse of Brajcinska reka 1 upstream to the intakes seem widened or completely new for the stretches from the (former) confluence of Brajcinska and Kriva Kobila, based on Google Earth "timelapse" images. Deposits of excavation materials are present on the sides of the road and there are signs of erosion. Also leftovers of tree roots have been dumped, signalling that a large

number of trees have been cut in the area. The road passes through an Important Plant Area[130] and it is assumed that increased traffic disturbs the wildlife. Patches of EC Habitats Directive Annex I habitat 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels was observed in the area. At the same time the presence of three individuals of brown bear was registered - footprints on the road to the intakes: 15, 10 and 8 cm wide - as well as fox footprints.

What went wrong

- The Brajcinska reka 1 powerplant violates Performance Requirement (PR 6) of the 2008 Environmental and Social Policy of the EBRD[131] that was valid in the period when the loan was approved, as well as the 2014 version that is currently in force. It conflicts with the provisions of the Policy that forbid projects that have detrimental effects on critical habitats.[132]
- Due diligence on the project either missed or ignored the impacts on Prespa trout and other sensitive species.
- Is is also unclear how monitoring of the project[133] missed the deficiencies observed during the field mission.

Recommendations:

- The normal natural flow should be restored in the river until the ecosystems recover. The currently established residual flow of 10 percent of the average annual flow should be re-examined, especially in the light of the high ecological sensitivity of the area.
- All the unnatural barriers (excavated materials, tree trunks, concrete blocks) should be removed from the riverbed
- The fish pass needs to be rebuilt to enable upstream and downstream migration of aquatic organisms.
- Careful restoration and rehabilitation of the forests damaged by the access roads should take place.

The Prespa trout

The Prespa trout is one of the most endemic trout species in the Balkans. It lives in only four river systems flowing into Lake Macro Prespa from the north and east: three in Macedonia (the Golema, Kranska and Brajcinska river systems) and one in Greece (the Agios Germanos river system).

*Recent studies gave the Prespa trout (*Salmo peristericus*) species status, mainly distinguishable by its low gill raker number and slender body as compared to the brown trout (*Salmo trutta*). IUCN has classified Salmo peristericus as Endangered,[134] facing a very high risk of extinction in the wild due to severe fragmentation of its habitat, limited extent and an observed continuing decline.*

The Prespa trout is not a homogeneous species: genetic studies showed that it could be divided into three well-documented genetic types: Golema (G), Kranska (K) and Brajcinska, composed of three subgroups Brajcinska upstream (BU), Brajcinska Rzanska (BR) and Brajcinska downstream (BD).[135] Therefore, conservation should be planned separately for each of the rivers with no inter-river system translocations that would upset the genetic structure of the population.[136]

Before the construction of the Brajcino 1 and Brajcino 2 hydropower plants (HPP) the species was already endangered. Many river stretches were deprived of trout (for example Brajcinska downstream from the village of Ljubojno). The connection between the Lake Macro Prespa and its tributaries had been almost cut off due to manmade structures and pollution and an increase in dry periods. For the period 2006-2011 only 5 individuals were studied in the lake.[137] Additionally the Golema and Kranska river populations seem to be too small to survive in the long term without proper management. Such a species is directly threatened by any local human modification and deserves a specific conservation procedure.

Brajcinska reka 2

- *Also known as: Brajcino 2*
- *Promoter & operator: PCC HYDRO DOOEL (owned by PCC DEG Renewables GmbH)*
- *Location: Southwest Macedonia, near the village of Brajcino, Resen municipality*
- *In operation since: 2014*
- *Intake on Brajcinska river: 40.917946, 21.194667*
- *Intake on Stanisar river: 40.919822, 21.182195*
- *Powerhouse: 40.911305, 21.171411*
- *Installed capacity: 1.4725 MW*
- *Loan: European Bank for Reconstruction and Development in 2011, EUR 6 million for a bundle of HPPs, equity investment of 50 percent from DEG, an investment arm of KfW, the German state bank*
- *Protected areas: Pelister National Park, Important Plant Area, Prime Butterfly Area*

Still well preserved habitats need constant monitoring. However, it might be too late for the Prespa trout, that is still found above the intakes but with the pressure on the whole cascade will gradually become extinct.

Brajcinska 2 or Brajcino 2 is a diversion scheme that uses two intakes, one on the Brajcinska river and one on the Stanisar river. The company received a EUR 670,000 discount on its EUR 6 million loan as an "incentive payment for the successful launch of the plants."[138] The intakes are on the very border of the Pelister National Park and inside an Important Plant Area as well as Prime Butterfly Area.

During Bankwatch's visit in September 2017, the powerhouse was not operating, so the flow of water was natural - 80-100 l/s for the intake on Brajcinska reka and 18 l/s on Stanisar – that is slightly more than the minimal residual flow stipulated by the water permits, 80 l/s and 13 l/s respectively. Both intakes are creating sand deposits in their respective ponds.

The intake on Stanisar river[139] mostly follows standards[140] in terms of the size and the design of the fish pass. It is worrying that alongside the fish pass, we observed an appliance that is most probably used for blocking it (similarly to the case of Lipkovo - see below). However, we did not observe directly this illegal practice. The Stanisar intake was one of the better performing intakes observed during the field visit in September 2017, apart from the fact that it did not contain submerged orifices so aquatic organisms other than fish cannot pass the barrier. At the same time the fish pass on the main, Brajcinska river[141] was not built according to best practices. The river biocorridor is partially blocked - the upstream exit does not allow jumping fish to migrate. Also the turbulence in the pools was high, making it harder for fish migrating upstream to find their way through the pass.

Figure 22: An appliance potentially used for blocking the fish pass on Stanisar intake

Figure 23: The upstream exit from the fish pass on Brajcinska intake

Our biological assessment showed populations of the Priority Species of Community Interest *Austropotamobius torrentium* on the Stanisar river above and below the intake, and on Brajcinska river below the powerhouse of Brajcinska reka 2.[142] Additionally, the Stanisar river above the intake supports the existence of the Balkan goldenring dragonfly *Cordulegaster heros*. Fish were found in the pool above the intake at Stanisar and just below the intake. The investigation showed that the habitats are well conserved or only slightly altered and support the presence of rich macroinvertebrate fauna and high diversity of sensitive taxa.

Nevertheless, it is not excluded that the additional water inflows from the Kalmar stream actually minimize the impact from the scheme especially in the lower sections.

What went wrong

- Although the environmental Elaborat study for Brajcino 2 is more comprehensive than any of the others, it still plays down the impact on the Prespa trout.
- It is unclear whether EBRD and KfW required a proper critical habitat assessment prior to building in this highly sensitive area.

Recommendations

- Frequent biological monitoring is required to confirm whether this favourable ecological state can be maintained over a longer period or whether the cascade will gradually have a negative impact on aquatic macroinvertebrates, especially on the Priority Species of Community Interest.

Tresonecka reka

Tresonecka reka or Tresonce hydropower plant is located within Mavrovo National Park, one of the major biodiversity hotspots in the Balkans, protected nationally as well as internationally as a nominated Emerald site, Important Plant Area and Important Bird Area. The whole park is under increased pressure from hydropower developers. Fifteen plants are planned, and two of them have already been built, including Tresonecka reka.[143] The Boskov Most project is also planned in the area downstream from the village of Tresonce, although its realisation is less likely now that financing from the EBRD has been cancelled.[144]

The setup of the Tresonecka plant is simple: it has one intake that takes the water down a 1.3 km long pipeline to the powerhouse.[145] The completely new road[146] is disturbing what is noted as a reproductive core area for the Balkan lynx. The new road has destroyed several hectares of oak forest and enabled access deep into a well preserved valley of the Mavrovo National Park. There is a lot of excavated material placed next to the road and erosion on the side of the road.

- *Also known as: Tresonce*
- *Promoter & operator: Hidro Enerdzi Group*
- *Location: Western Macedonia, near the village of Tresonce, municipality of Mavrovo and Rostuša*
- *In operation since: 2013*
- *Intake: 41.567048, 20.743144*
- *Powerhouse: 41.561898, 20.729182*
- *Installed capacity: 1.98 MW*
- *Loan: EUR 3 million from the EBRD for a bundle of HPPs*
- *Protected areas: Mavrovo National Park, proposed Emerald site, Important Plant Area, Important Bird Area*

A drastic drop in aquatic biodiversity in the section between the intake and the powerhouse was identified. The most probable reason is extended periods with no water at all or insufficient residual flow. Endemic and previously undescribed species identified.

Figure 24: The road to the intake

Figure 25: The intake with the new fish pass

The high value of the area was confirmed by our field mission in September 2017: our biological assessment indicated a "healthy" sector of the Tresonecka river above the intake. The sampling revealed the presence of subendemic species such as caddisfly (*Thremma anomalum*), as well as *Bythinella drimica drimica* noted as "least concern" on the IUCN Red List of Globally Threatened Species and on European Red List of Non-marine Molluscs.[147] The team also discovered a still undescribed representative of leeches (Dina sp. nov. 1), that adds to the overall impression that the area contains rich biodiversity.[148]

However, the situation is drastically different in the section below the intake. A reduction of aquatic invertebrate species and the disappearance of endemic species including the undescribed leech Dina sp. nov. 1 was noted. The community structure indicates a high level of ecosystem stress or poor to bad ecological status.[149]

The most probable reason for this is a lack of water for prolonged periods. The residual flow determined by the water permit is 0.10 m^3/sec.[150] However, black lines on the stones suggested that the water level in the previous period was around 10-15 cm lower than during the field monitoring and that water fluctuations are common, or that the river bed is dry for part of the year. The mass occurrence of algae on stones as well as the presence of eurivalent species such as aquatic snails from the family *Lymnaeidae* above the powerhouse confirms this presumption.

We have also obtained pictures of the river from local activists in which it is obvious that the river bed is completely dry.

The main barrier is the intake: submerged orifices were not detected in the fish passage, and if they

Figure 26: The weir above the powerhouse September 2017

Figure 27: The weir above the powerhouse November 2017

exist, are possibly blocked by gravel.[151] The upstream exit point is lower than the pool level.

Otherwise, the fish passage was constructed properly, although only after the intervention of the EBRD.[152] Thorough fish pass monitoring, including a video camera submerged at the upstream exit, is recommended to prove the fish pass functionality. No fish were registered between the intake and powerhouse. Trout were present 1 km below the village of Tresonce (in the Boskov Most area) and abundant downstream from Rosoki bridge, where larger fish were observed.

In the pool above the intake there is an artificial structure made of rocks, possibly to stop branches reaching the intake grates, but it also represents a potential obstacle for fish and aquatic organisms' migration.

Interviews with local people in the village of Tresonce revealed that in the past there was an abundance of fish in the river. However local residents also state that there is a lack of water between the intake and the powerhouse and that they have "requested that the water is released". They believe that the state of the flow in September 2017 is a result of their request.

What went wrong

Although the EBRD hydropower lending guidelines[153] state that: "A good understanding of the nature of aquatic ecosystems (habitats, riparian flora, macroinvertebrates, fish, aquatic and semi-aquatic mammals and amphibians) is the basis for an assessment of the impacts of a hydropower scheme on these ecosystems" the environmental Elaborat study showed no prior field research.

Given that the project is in a National Park and proposed Emerald site, the EBRD should have, at the very minimum, requested a full Environmental and Social Assessment.

Recommendations

- The power-plant operator should release publicly data about the residual flow; the residual flow requirement should be re-assessed in the light of the findings about the poor condition of the ecosystem in the stretch between the intake and the powerhouse.
- Fish pass monitoring should prove the effectiveness of the fish pass
- No more hydropower plants in Mavrovo National Park

Lipkovo

The Lipkovo or Kamena Reka project is built on the river of the same name, in an area designated as having high biodiversity value by Plantlife International's classification.[154]

Previously available scientific studies also show the presence of Species of Community Interest the Balkan goldenring dragonfly *Cordulegaster heros*[155] and Priority Species the stone crayfish *Austropotamobius torrentium*.[156] The area's high biodiversity value was confirmed by our field visit in September 2017, when these species, both listed in the Annex II of the Habitats Directive, were

- *Also known as: MHEC Kamena reka 125*
- *Promoter & operator: SOL Hidropauer DOOEL owned by Sol SpA, Italy*
- *Location: Nearby the village of Goshintse, Lipkovo municipality, North of Macedonia*
- *In operation since: 2015*
- *Intake: 42.222089, 21.503178*
- *Powerhouse: 42.197826, 21.523395*
- *Installed capacity: 2.4 MW*
- *Loan: EUR 3.5 million EIB loan through the Macedonian Bank for Development Promotion for both Lipkovo and Bistrica*
- *Protected areas: Skopska Crna Gora Important Plant Area*

The project operator is blocking the fish pass and neglecting previous studies that show high biodiversity and Species of Community Interest in the area. The pool at the project's intake is showing signs of eutrophication.

A sign of clean rivers: Austropotamobius torrentium

It is common folk knowledge in the Balkans that the presence of this crayfish species indicates clean water, even safe for drinking. The fact that crayfish prefer pristine environments is also confirmed by the scientific studies.[159] *This species is most commonly found in headwater streams with plenty of riparian and instream cover. Declines in this keystone species are said to negatively impact both ecosystem structure and function within freshwater environments.*

It is on the IUCN red list, assessed as Data Deficient. While this species is relatively widespread across Europe it is undergoing significant declines throughout much of its range. Further research on rates of decline is urgently needed before an accurate assessment of conservation status can be made.[160] *Our field visit identified the presence of the priority species* Austropotamobius torrentium *above the intake and below the powerhouse of Lipkovo (Kamena reka), as well as above and below the intake on Stanisar river, and below the powerhouse on Brajcinska river (Brajcinska reka 2).*

Figure 28: (c) Christoph Leeb, CC license

identified. Their conservation requires designation of Special Areas of Conservation (SACs) within the Natura 2000 network.[157] The area above the intake is characterized by significant biological diversity, high ecological status, and no sign of fragmentation of the populations.[158] Also, two individuals of yellow-bellied toad *Bombina variegata*, an Annex 2 Habitats Directive species, was found in a small pond next to the river.

However, the environmental Elaborat study did not identify any Priority Species. The study contains minimal data about the biodiversity in the area, and no indication of any field visit done to survey the local flora and fauna. This is a major deficiency, that influences the decision to build on the particular location, as well impacting the choice of planned mitigation measures.

Fragmentation of the pristine ecosystem starts before the intake – in the pool that the intake creates by slowing down the river, gas bubbles are visible on the surface. The intake itself is a further obstacle: the upper exit of the fish pass is blocked with a manmade appliance. No water is running through the fish pass at all.[161]

There are excessive algae communities and the stones are black from poor water quality or lack of water. Our biological assessment showed that the density of macroinvertebrates and the number of sensitive taxa moderately decreased, confirming less favourable conditions.[162]

Figure 29: Blocked fish pass

Figure 30: The intake and the pond

Figure 31: Rocks below the intake

The absence of Species of Community Interest is most likely a result of the loss of changes in riparian vegetation. Concerning the Priority Species, the stone crayfish, the deposition of sediment in the riverbed and the loss of riparian vegetation by this part of the river do not provide appropriate shelter to protect the species from predators or to prevent drift.[163]

Local people claim that there is usually no water in the river bed for the most of the year.[164]

The impact of the access road is also visible and its construction was not properly assessed. A satellite image from 2002 shows there was no road in the river bed. In particular the mid section of the road is affected by erosion. Our field visit identified 6430 Hydrophilous tall herb fringe communities found along the river, and patches of the habitat 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*.

Different habitats were destroyed due to blasting of rocks, taking material from unofficial quarries, disposal of material, destruction of forests and shrub communities. There are logging operations in the vicinity and because of lack of water in the river the watercourse is blocked with tree branches.

What went wrong

The EIB should have been alarmed by the quality of environmental studies done. It is not clear if monitoring of the plant has been conducted, but even the simplest visual check would discover the deficiencies such as the blocked fish passes or erosion and destruction of the riparian vegetation.

Recommendations

- Ensure that blocking of the fish passes does not occur, via ensuring constant video monitoring

Figure 32: Kamena reka 2002 Google Earth

Figure 33: Kamena reka 2017 Google Earth

- Rehabilitate the riparian vegetation and forests destroyed by building the new road
- Ensure regular biodiversity monitoring of the Priority Species present in the area
- Clean up the pool created by the intake

Tearce 97-99

The cascade is made up of four bundles of facilities, starting from the Tearce 97 intake, followed by two points where the powerhouses and the intakes for Tearce 97-98 and 98-99 are located near each other, and finally, the powerhouse of Tearce 99. Overall, around 5.3 km of the pipelines are buried in the ground and around the same length of access roads have been carved into Shar mountain. The same Italian company as in the case of Lipkovo is the main investor.

Given that this is a cascade, it is worth noting that the environmental Elaborat studies for the plants do not mention cumulative impacts.[165] A document named "Strategic Impact Assessment" exists for each of the plants separately. These were carried out for projects rather than plans or programmes because a new spatial plan was needed for the area. However it is not clear why they were done for each plant separately, nor why these "Strategic Impact

- *Also known as: Bistrica 97-99*
- *Promoter & operator: SOL Hydropower (owned by SOL SpA)*
- *Location: Northeast Macedonia, near Tetovo*
- *In operation since: 2014*
- *Intake 97 42.112844, 21.002280 Intake 98 42.107190, 21.023061 Intake 99 42.097678, 21.037728*
- *Powerhouse 97 42.107374, 21.022226 Powerhouse 98 42.097941, 21.037019 Powerhouse 99 42.089182, 21.051334*
- *Installed capacity: 97 2.64 MW 98 3.2 MW 99 3.28 MW*
- *Loan: EUR 3.5 million EIB loan through the Macedonian Bank for Development Promotion for both Lipkovo and Bistrica (Tearce).*
- *Protected areas: Proposed Emerald site, Important Plant Area, Prime Butterfly area*

Building a hydropower cascade in an area of high biodiversity value means risking biodiversity loss.

Figure 34: Tearce cascade. Red - Proposed Emerald, Green - IPA, Purple - PBA; Google Earth

Assessments" do not analyse cumulative impacts.

Our field visit in September 2017 confirmed that the Bistrica river above the highest intake (Tearce 97), located in the nominated Emerald zone, is in pristine, natural condition with well-developed riparian vegetation. The presence of adult specimens of the sensitive *Limnius volckmarii (Coleoptera)* additionally indicate favourable, undisturbed conditions.[166]

However, at the same intake no. 97, the river biocorridor is disrupted – there is a new culvert and the water is sinking into the riverbed substrate below the culvert, thus blocking fish migration. Some 100 metres below there is also a natural obstacle to migration. Following the principle Polluter/Operator Must Pay of the EU Water Framework Directive, the operator should arrange river bed restoration as it is currently partially filled with materials that have been dumped from the construction of the access road.

Otherwise, the fish pass dimensions at the Tearce 97 intake are within the recommended limits. Notches and submerged orifices are available to enable small fish and aquatic species to migrate, but they cannot enter the pass. The residual flow of 68 l/s is not followed, as the team estimated 30-40 l/s at the exit of the fish pass.[167]

During the construction of the road to the intake and the excavation for the pipeline, the materials were dumped in the riverbed, as evidenced on the image above. On the side of the road, there were excessive stretches of the woods cut, almost clearcuts, and in some sections erosion on the hillsides. The lower stretches of the Bistrica valley are covered with Chestnut (*Castanera sativa*) forest (Directive 42/43 habitat 9260) especially on the right bank of the river. Habitat 9170 (oak and hornbeam) is found in the middle sections of the river. Higher up beech forests are dominant with *Taxus baccata*. In some steep areas Priority Habitat 9180 was found at the river edge.

Figure 35: Culvert

Figure 36: Riverbed filled with branches and excavated materials

The forests around the roads are very degraded. It is likely that new unsustainable logging occurred after the HPP was built, but there is no proof that the better access roads are related to it. On the left side of the river where there are no roads, very old stands of beech and 9180 forests still remain. We found two individuals of the very rare white-backed woodpecker (*Dendrocopus leucotus*) - maybe the first location for Shar Mountain. This woodpecker is found in very old beech forest with many large standing dead trees.

The other two HPPs of the cascade - Tearce 98 and Tearce 99 - were not working and the natural river flow was running below the water catchments as it should, because the visit was during a low water period, when water is not supposed to be taken from the river by definition.

Two additional problems were discovered. The fish passes were not operating properly - there was too much turbulence in some of the pools, water was not running over some of the partitions/notches, and some of the jumps were too high.[168] Therefore these pool type fish passes need to be adjusted at some point.

In the area around above and below the second intake (Tearce 98) the biodiversity is moderately decreased, indicating less favourable living conditions at that section of the Bistrica river although the decline is not drastic.[169] Aquatic insect populations in this stretch were represented by those in their early larval stages, more prone to drifting and thus more easily colonizing downstream areas. For more precise assessment of the impact of this hydropower and determination of the actual condition, further investigation should be focused on this river sector.[170]

The worst condition concerning biological diversity and ecological status (poor) was noted below the third intake (Tearce 99). The drastic reduction of aquatic invertebrate species may be a result of the cumulative effect from the HPP cascade system and of deteriorated water quality caused by the settlement.[171] At the Tearce 99 water catchment an additional man-made obstacle to migration was discovered in the riverbed nearby above the intake.[172]

A fisherman encountered by the team on the way said that during the summer there was no (or little) water in the riverbeds but after 15 August the operator had released the water and the plants were not operational. Another fisherman we met said that there was fish in the rivers and he caught 5-6 fish a day in the area of the plants. Before the plants he caught up to 40 fish. Although this indicates a drop in the abundance of the fish it is also a sign that at least the some sections of the river were not completely dry and devoid of fish fauna.

What went wrong

The EIB should have been alarmed by the poor quality of the environmental studies. It is not clear whether the Bank or the intermediary has carried out any monitoring. The simplest visual monitoring would discover the blocked biocorridor and excessively cut forests.

Recommendations

- At least the minimal residual flow at Tearce 97 should be restored in the river until the ecosystems recover. The currently established residual flow of 10 percent of the average annual flow should be re-examined in the light of the high ecological sensitivity of the area.
- Clean up any unnatural obstacles from the river bed, including the culvert.
- Careful restoration and rehabilitation of the forests damaged by the access roads should take place.

Annex: methodology

Bankwatch's team visited two locations in Albania in June 2017, four locations in Macedonia in September 2017, and one location in Croatia in October 2017.

The method of gathering information in Albania and Macedonia was twofold: the team visited the plants and carried out a visual evaluation of the available water in the river bed, as well as of other relevant indicators of the quality of the management of the plants such as erosion, the method of disposal of the excavated materials, vegetation around the river bed and so on. At the same time, the team conducted 32 semi-structured interviews - both individual and group ones - with different actors such as the Directorate on Protected Areas, Forestry Inspectorate, representatives of hydropower companies, affected local communities, local anglers, media and NGOs.

The focus of the investigation and interviews was on identifying the impacts of the hydropower plants as well as describing the public participation of the local communities and of competent authorities in the planning, building and operation of the power plants. The team was trying in particular to identify different water needs of the communities and how their access to water has changed since the hydropower plants were built; at the same time the team collected data on the quality and frequency of the communication of the local community with the project promoters and financiers.

The team made efforts to overcome gender barriers and to speak to female members of the households. In the case of the villages close to Ternove project, the team have tried to interview supporters of the both dominant political parties in order to get a balanced picture of the local circumstances. Given the time and the scoping nature of the investigation, the team often spoke to 'gatekeepers' - the local leaders and (self-appointed) representatives. In case of a repeated and more comprehensive investigation, efforts should be made to bypass the gatekeepers to get information from different actors in the local social hierarchies. In Macedonia, separate questionnaires were developed for interviewing communities and anglers.

Additionally, in Macedonia the team conducted a hydrological study (study of the river flows and fish passes) as well as a stream ecological integrity study. As a result of the former, checklists with data about the size and performance of the fish passes, residual flows, status of the riverbed were compared to best practices guidelines.[173] The checklists are publicly available and referenced in the relevant case studies. The results and methodology of the hydrological study are described in detail in a separate study.[174]

In Croatia, due to the different nature of the plant and issues around it, a site visit was conducted in October 2017 and an interview with NGO Eko-Pan carried out, however much of the case study is based on desk research.

Endnotes

1. http://balkanrivers.net/en/content/studies
2. https://bankwatch.org/publication/financing-for-hydropower-in-protected-areas-in-southeast-europe
3. Bankwatch's 2015 study put the total number at 30. Of these, 21 HPPs planned, being built or in operation in existing or planned protected areas or internationally recognised areas of high biodiversity were identified as EBRD-financed. Out of these, we learned through follow-up communication with the EBRD that loans for five plants have been cancelled. Also, the EBRD has informed us that one plant - Kamenicka Reka - is located in a biodiverse rich area (300 m from a nominated Emerald site) but not inside and not clearly impacting on the protected area.
4. Mott MacDonald, Regional Strategy for Sustainable Hydropower in the Western Balkans Draft Background Report 1, p.30
5. Natura 2000 is a network of sites selected to ensure the long-term survival of Europe's most valuable and threatened species and habitats. The Natura 2000 network stems from the Habitats Directive.
6. http://www.ebrd.com/documents/environment/pdf-guidance-note-hydropower.pdf
7. https://d2ouvy59p0dg6k.cloudfront.net/downloads/hidro_v6_webr.pdf
8. https://portals.iucn.org/congress/motion/026
9. As defined in the EBRD 2014 Environmental and Social Policy http://www.ebrd.com/news/publications/policies/environmental-and-social-policy-esp.html
10. Such as ProCredit bank's exclusion list that includes "Activities within, adjacent to, or upstream of designated protected areas under national law or international conventions, sites of scientific interest, habitats of rare/endangered species, and primary/old growth forests of ecological significance" https://www.procreditbank.bg/uploads/AboutUsImages/exclusion_list_en.pdf
11. Albania, Bosnia-Herzegovina, Macedonia, Montenegro, Kosovo, and Serbia. The phenomenon is also present in nearby countries such as Bulgaria, Romania, Croatia and Slovenia to varying degrees.
12. Kraja, Durim, Concessions In The Hydropower Sector In Albania – Challenges And Opportunities, Studies in Business and Economics, undated, http://eccsf.ulbsibiu.ro/articole/vol91/917kraja.pdf
13. Regional Strategy For Sustainable Hydropower In The Western Balkans Background Report No. 1: Past role of hydropower and prospects for future utilisation of hydropower potential in the region by 2030 and beyond - Draft V1, p.24.
14. https://bankwatch.org/publication/financing-for-hydropower-in-protected-areas-in-southeast-europe
15. Bankwatch's 2015 study put the total number at 30. Of these, 21 HPPs planned, being built or in operation in existing or planned protected areas or internationally recognised areas of high biodiversity were identified as EBRD-financed. Out of these, we learned through follow-up communication with the EBRD that loans for five plants have been cancelled. Also, the EBRD has informed us that one plant - Kamenicka Reka - is located in a biodiverse rich area (300 m from a nominated Emerald site) but not inside and not clearly impacting on the protected area.
16. See country profile in the Annual Implementation Report Energy Community Secretariat, 1 September 2017
17. 10 MW is the threshold most often used in Europe, for example in National Renewable Energy Action Plans.
18. Mott MacDonald, Background Report No. 7, Environmental Analysis for HPP Projects in the WB6 Region Draft V1, p 155-182
19. Peter J Nelson: EIA/SEA of hydropower projects in Southeast Europe: Meeting the EU standards, WWF and South East Europe Sustainable Energy Policy, November 2015 http://seechangenetwork.org/wp-content/uploads/2015/11/EIASEA-of-hydropower-projects-in-Southeast-Europe-%E2%80%93-Meeting-the-EU-standards.pdf
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21. For instance DVWK, F. (2002). Fish Passes: Design, Dimensions, and Monitoring http://www.fao.org/docrep/010/y4454e/y4454e00.htm and Schmutz, S., & Mielach, C. (2013). Measures for ensuring fish migration at transversal structures. ICPDR-Internat. Commission for the Protection of the Danube River https://www.icpdr.org/main/sites/default/files/nodes/documents/icpdr_fish_migration_final.pdf

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26. http://assets.panda.org/downloads/prezentacija___prikaz_rezultata_svih_odabranih_metoda.pdf
27. See for instance media reports about the EBRD-financed Kraljuscica project in Bosnia and Herzegovina https://www.klix.ba/vijesti/bih/konjic-ribari-upozoravaju-na-potpuni-nestanak-rijeke-nakon-izgradnje-elektrana/17061213 or the EBRD-financed Dabrova dolina https://www.24sata.hr/news/gdje-je-nestao-slap-ostao-bez-vode-zbog-male-hidroelektrane-527181
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29. Ibid, p. 251
30. Mott MacDonald, Regional Strategy for Sustainable Hydropower in the Western Balkans Draft Background Report 1, p.30
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33. https://d2ouvy59p0dg6k.cloudfront.net/downloads/hidro_v6_webr.pdf
34. https://portals.iucn.org/congress/motion/026
35. As defined in the EBRD 2014 Environmental and Social Policy http://www.ebrd.com/news/publications/policies/environmental-and-social-policy-esp.html
36. Such as ProCredit bank's exclusion list that includes "Activities within, adjacent to, or upstream of designated protected areas under national law or international conventions, sites of scientific interest, habitats of rare/endangered species, and primary/old growth forests of ecological significance" https://www.procreditbank.bg/uploads/AboutUsImages/exclusion_list_en.pdf
37. IEA indicators for 2015, http://www.iea.org/statistics/statisticssearch/report/?year=2015&country=ALBANIA&product=ElectricityandHeat
38. Page 3: http://www.ecoalbania.org/wp-content/uploads/2017/05/HPPs_al_final-report_me-kapak.pdf
39. https://www.climatechangepost.com/albania/biodiversity/
40. Article 16c http://www.qbz.gov.al/Botime/Akteindividuale/Janar%202017/Fletore%20116/LIGJ%20nr.%2081,%20date%204.5.2017.pdf
41. http://www.ecoalbania.org/wp-content/uploads/2017/05/Vendimi-i-Gjykates_HEC_Po%C3%A7em.pdf
42. Following the approach in IUCN Motion 26 on Protected areas and other areas important for biodiversity in relation to environmentally damaging industrial activities and infrastructure development https://portals.iucn.org/congress/motion/026
43. On the older maps the river is also identified as Rapuni or Rrapun.
44. http://investigim.al/en/45-hidrocentralet-qe-rrezikojne-parkun-kombetar-te-librazhdit/
45. Management Plan for Shebenik-Jabllanicë National Park 2015-2024 (unpublished), p. 30
46. Ibid., p. 20
47. The field visit was organised in close cooperation with EcoAlbania and Egnatia
48. http://stories.bankwatch.org/going-through-the-mill
49. https://bankwatch.org/blog/campaign-update-ebrd-confirms-negative-impacts-of-albanian-hydropower-plants-on-people-and-the-environment
50. Project Design Document (PDD) Rapuni 1 & 2 Small Hydroelectric Power Projects in Albania, p.23 available at https://cdm.unfccc.int/Projects/Validation/DB/AJPEKEUWN3GZ9MOINEVTOA7AA3Y2IQ/view.html
51. Correspondence with the National Environment Agency of Albania, 14 February 2017
52. Correspondence with the EBRD, 25 August 2017, https://bankwatch.org/wp-content/uploads/2017/09/response-EBRD-RapuniTernoveAL-Aug2017.pdf
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56. https://bankwatch.org/wp-content/uploads/2017/09/response-EBRD-RapuniTernoveAL-Aug2017.pdf
57. Correspondence with the EBRD, 15 November 2017
58. https://bankwatch.org/wp-content/uploads/2017/09/response-EBRD-RapuniTernoveAL-Aug2017.pdf

59. http://www.qkr.gov.al/search/search-in-trade-register/search-for-subject/ accessed on 23 November 2017)
60. http://www.qkr.gov.al/search/search-in-trade-register/search-for-subject/ accessed on 23 November 2017)
61. Ibid.
62. According to the owner, the mill alone is used by 200 households in the vicinity
63. Phone interview with Perparim Shkurti, the son of the owner of the mill, 15 November 2017
64. https://web.archive.org/save/http://orthodoxalbania.org/alb/index.php/en-us/lajme-3/blog/4002-archbishop-anastasios-speech-at-the-ceremony-of-inauguration-of-rapuni-3-4-hydropower-station
65. Interviews in Togez community, 2 June 2017; also see Bankwatch's report http://stories.bankwatch.org/going-through-the-mill
66. Interview with Arjan Cukaj, the owner of C & S construction 5 June 2017
67. Correspondence with the EBRD, 15 November 2017
68. See information about contract: http://www.opencorporates.al/en/nuis/K92402005Q; the fact that the design of the Rapuni 3 & 4 was different at that moment does not excuse a need to assess the cumulative impacts
69. http://business.financialpost.com/commodities/energy/quebec-entrepreneurs-bring-hydroelectric-expertise-to-the-balkans
70. https://web.archive.org/web/20171117083345/http://ice.al/detailed-design-of-hydropower-of-ternova/
71. https://bankwatch.org/wp-content/uploads/2017/09/response-EBRD-RapuniTernoveAL-Aug2017.pdf
72. VENDIM Nr. 676, datë 20.12.2002 PËR SHPALLJEN ZONË E MBROJTUR TË MONUMENTEVE TË NATYRËS SHQIPTARE http://extwprlegs1.fao.org/docs/texts/alb68750.doc see also http://eunis.eea.europa.eu/sites/182252; This claim is disputed by the EBRD, but with no source for different interpretation provided
73. The EBRD refused to share a map of the project with Bankwatch (Correspondence with the EBRD, 15 November 2017). We base our understanding of the project scheme on interviews with local stakeholders and satellite imagery. The locals as well as construction companies use different toponyms for the above-mentioned lakes, which leads to further confusion.
74. Study: Identification of water related conflicts linked to hydropower projects in Albania, p. 41 http://www.ecoalbania.org/wp-content/uploads/2017/04/Water_conflict_study-2017-1.pdf
75. A public sector employee who wished to remain anonymous have point us to the fact that the works started without proper permits. Media reports about the protest are also pointing out to the lack of permits http://www.tvbulqiza.al/bulqize-devijimi-i-rrjedhes-se-liqenit-ne-martanesh-protestojne-banoret-videolajm/
76. The field visit was organised in close cooperation with EcoAlbania and local partners
77. https://bankwatch.org/blog/from-enver-hoxha-to-the-ebrd-and-back-hydropower-in-albania
78. https://bankwatch.org/wp-content/uploads/2017/09/response-EBRD-RapuniTernoveAL-Aug2017.pdf
79. Interviews with employees of the Forest Inspectorate
80. The State Inspectorate of Environment and Forestry fined the company Teodori 2003 shpk 26,865,148.4 ALL (203,523 EUR) in 2013. The local inspectorate doesn't know the exact status of the fine but has been informed that the company appealed against the fine.
81. Mansourian, S., Rossi, M., & Vallauri, D. (2013). Ancient Forests in the Northern Mediterranean: Neglected High Conservation Value Areas. Marseille, WWF France https://www.researchgate.net/profile/Daniel_Vallauri/publication/270647800_Ancient_Forests_in_the_Northern_Mediterranean_Neglected_High_Conservation_Value_Areas/links/54b1ab510cf28ebe92e18f85.pdf (page 32)
82. Bego, F. (2005). On the status and distribution of the large carnivores (Mammalia: Carnivora: brown bear, wolf and lynx) in Albania. Albanian J. Nat. Tech. Sci, 1, 41-53.
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84. Correspondence with EBRD, 15 November 2017
85. Bankwatch has not had access to the project documentation, but this is inferred from the fact that the project is also bringing additional water from other lakes, meaning that there is not enough water for the project from this lake alone. It is not clear whether the artificial reservoir was planned before the hydropower plant but it was at least partly built with an involvement of the project company.
86. Meeting between Bankwatch and EBRD staff, London, 26 January 2016
87. Phone interview with a member of the community who wishes to remain anonymous, September 2017

88. Bujar Karoshi, Liqeni i Zi “nxin” mbi të ardhmen e Zerqanit! (in Albanian) http://www.rrugaearberit.com/arkiva/2014/gusht2014.pdf
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91. http://ec.europa.eu/environment/nature/natura2000/awards/news/archives/2014/01/news_20140203_02_en.htm
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93. https://www.hera.hr/hr/html/dozvole_tab01.html
94. Response to Bankwatch information request by the EIB, 4 February 2016, Zagrebačka banka: http://aecm.eu/wp-content/uploads/2016/09/AECM-OTS-Zagreb-2015-ZABA.pdf
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115. https://bankwatch.org/wp-content/uploads/2015/12/SEE-hydropower-financing.pdf
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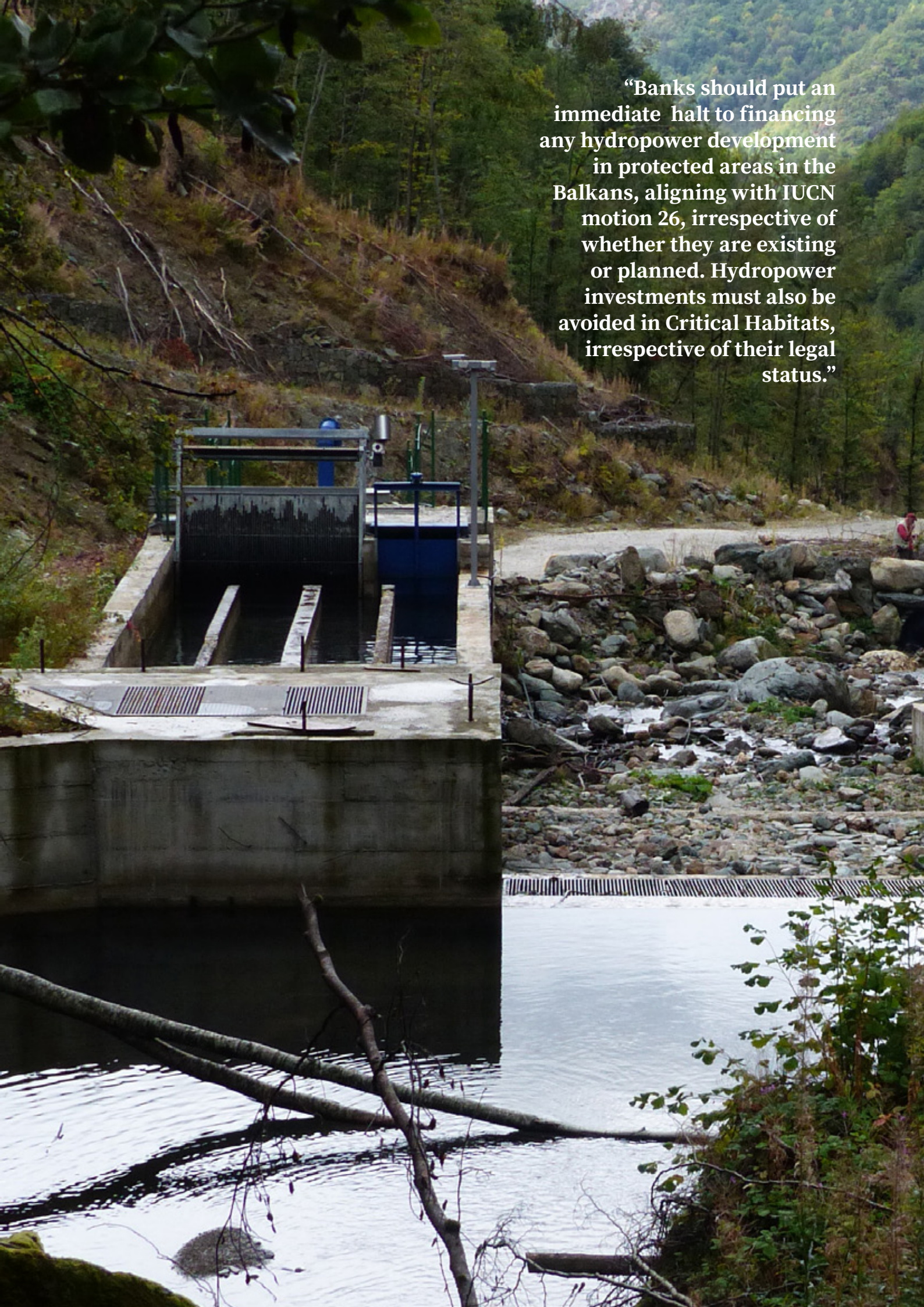

“Banks should put an immediate halt to financing any hydropower development in protected areas in the Balkans, aligning with IUCN motion 26, irrespective of whether they are existing or planned. Hydropower investments must also be avoided in Critical Habitats, irrespective of their legal status.”