= Ombla =

The Ombla is a short river in Croatia , northeast of Dubrovnik . Its course is approximately 30 metres (98 feet) long , and it empties into the Rijeka Dubrova?ka embayment of the Adriatic Sea near Komolac in Dubrovnik @-@ Neretva County . Rijeka Dubrova?ka is actually a ria , a flooded river valley formed through changes in sea surface elevation on a geologic time scale . The river rises as a karst spring fed by groundwater replenished by Trebi?njica , which is an influent stream flowing in Popovo Polje , in the immediate hinterland of the Ombla . The elevation difference between the river 's source and its mouth is just over 2 metres (6 feet 7 inches) . The average discharge of the river is 24 @.@ 1 cubic metres (850 cubic feet) per second . The drainage basin of the Ombla encompasses 600 square kilometres (230 square miles) and , besides the short surface course , includes only groundwater flow .

The Ombla is used as a source of drinking water for Dubrovnik 's water supply network , and construction of a hydroelectric power plant has been planned for the past two decades . As of 2012 , the plans entail construction of a subsurface reservoir and a 68 megawatt power plant . The plan sparked controversy amid doubts raised with respect to environmental protection and biodiversity management , technical and financial feasibility , and procedural problems related to the project . A particular concern expressed was that the underground reservoir might trigger earthquakes .

= = Source and course = =

The course of the Ombla River is located in the Dubrovnik @-@ Neretva County , northeast of the city of Dubrovnik in the southernmost part of the mainland of Croatia . The area surrounding the river , known as Rijeka Dubrova?ka (lit . Dubrovnik 's River) , encompasses several villages clustered near the Ombla that are home to 12 @,@ 000 people . The name is also applied to an estuary of the Ombla ? a ria enclosed by steep slopes of 600 @-@ metre (2 @,@ 000 ft) high hills , forming a 5 @-@ kilometre (3 @.@ 1 @-@ mile) long , 200 @-@ to @-@ 400 @-@ metre (660 to 1 @,@ 310 ft) wide and 26 @-@ metre (85 @-@ foot) deep embayment of the Adriatic Sea . The Ombla rises at the foot of the 422 @-@ metre (1 @,@ 385 ft) Golubov Kamen massif , a landform that straddles the border between Croatia and Bosnia @-@ Herzegovina .

The river rises in a 80 @-@ by @-@ 40 @-@ metre (260 by 130 ft) cave whose roof has an 8 @-@ metre (26 ft) clearance above the surface of the water . The primary source is located at an elevation of 15 metres (49 feet) below sea level , and the secondary sources are found at 2 @.@ 5 metres (8 feet 2 inches) above sea level (a.s.l.) . The spring is the largest karst spring in Croatia , and one of the largest ones in the Dinarides . The surface of the water in the cave is 2 @.@ 38 metres (7 feet 10 inches) a.s.l. The watercourse flows for approximately 30 metres (98 feet) before reaching a weir across which the Ombla discharges into the Adriatic Sea , leading to claims that the Ombla is the shortest river in the world .

= = Drainage basin = =

The drainage basin of the Ombla is estimated to cover an area of at least 600 square kilometres (230 square miles) , and up to 900 square kilometres (350 square miles) between the Adriatic Sea coast in the area of Dubrovnik and Popovo Polje . Other than the short surface course of the river , the drainage basin includes groundwater only . The exact boundaries of the drainage basin vary depending on prevailing hydrological conditions determining groundwater seepage and flow . The area comprises 176 settlements and 50 @,@ 000 inhabitants .

The area exhibits karst morphology , with bedrock largely consisting of limestones and comparatively small areas of dolomites and Quaternary sediments . Eocene flysch forms the southwest boundary of the catchment area , towards which the catchment basin drains and where the Ombla rises . The rocks were formed as a thick series of carbonate sediments were deposited between the Norian and Late Cretaceous as the Adriatic Carbonate Platform , up to 8 @,@ 000 metres (26 @,@ 000 ft) deep . In the Eocene and early Oligocene , the Adriatic Plate moved north

and north @-@ east , contributing to the Alpine orogeny via the tectonic uplift of the Dinarides . The basin 's karst topography developed from the carbonate platform 's exposure to weathering . Karstification largely began after the Dinarides ' final uplift in the Oligocene and the Miocene , when the carbonates were exposed to atmospheric effects ; this extended to the level of 120 metres (390 feet) below the present sea level , exposed during the Last Glacial Maximum . Some karst formations were created during earlier sea level drops , most notably the Messinian salinity crisis . The geological structure of the area indicates recent tectonic activity in the catchment , with a fault running between Hum and the Ombla . A recent strong earthquake in the wider region was the 1979 Montenegro earthquake , measuring 7 @.@ 0 on the Richter scale . The only strong historical earthquake in the immediate area was the 1667 Dubrovnik earthquake , which was followed by a tsunami .

The hydrological regime of the basin and Popovo Polje is determined by the flow of the Trebi?njica ? a losing stream disappearing underground in the polje . The groundwater is distributed to a number of springs . Some of them are headwaters of watercourses discharging into the Neretva River to the northwest of the polje , or appearing as vruljas (submarine springs) or as headwaters of the Ombla river . Flow rate of the Ombla River , measured at the Komolac water intake plant , ranges from 3 @.@ 96 to 104 cubic metres (140 to 3 @,@ 673 cubic feet) per second , averaging 24 @.@ 1 cubic metres (850 cubic feet) per second . The average has dropped by about 10 cubic metres (350 cubic feet) per second since completion of Trebi?njica Hydroelectric Power Plant and the concreting of the Trebi?njica 's river bed . On the other hand , the minimum discharge was not affected by the river engineering works .

The catchment basin area straddles boundary of two climate zones ? the Mediterranean climate zone in areas at elevations up to 400 metres (1 @,@ 300 feet) a.s.l , and the continental climate zone in other parts of the basin . Average annual precipitation varies depending on the climate zones : 1 @,@ 238 millimetres (48 @.@ 7 inches) in Dubrovnik , at the coast , and 2 @,@ 037 millimetres (80 @.@ 2 inches) in Hum , in Popovo Polje .

= = Economy = =

As of 2012 , the Ombla is used as a source of drinking water for the city of Dubrovnik . The water intake plant at Komolac has a water supply capacity of 560 litres (120 imperial gallons ; 150 US gallons) per second . The Ombla has been used as a part of Dubrovnik 's water supply network since 1897 , when the first contract to supply 960 cubic metres (34 @,@ 000 cubic feet) of water per day was made with an owner of watermills operating on the river . The river water becomes opaque , containing increased proportion of suspended particulate matter , three to five times a year for periods of four to five days after increased rainfall . The situation is proposed to be addressed through moving of the intake plant to a higher elevation during construction of a proposed Ombla Hydroelectric Power Plant (HPP) . The new water intake is planned to be constructed at 55 metres (180 feet) a.s.l. These changes are expected to improve the quality of the drinking water , and to increase the water supply capacity to 1 @,@ 500 litres (330 imperial gallons ; 400 US gallons) per second . Average volume of water diverted to the water supply network varies considerably by month , peaking during summer tourist seasons . In August 2008 , daily volume of water taken from Ombla for the water supply network averaged at 23 @,@ 419 cubic metres (827 @,@ 000 cubic feet) . In 2008 , the annual daily volume of the water diverted averaged 17 @,@ 750 cubic metres (627 @,@ 000 cubic feet) .

= = = Proposed power plant = = =

The Ombla HPP is proposed to be built as an underground power plant utilizing headwaters of the Ombla River through a planned underground reservoir , which would hold the water behind a grout curtain and a concrete block extending from 250 metres (820 feet) below sea level to 135 metres (443 feet) a.s.l. The project entails flooding of a cavern system at the spring to a level 7 metres (23 feet) below the entrance to the 3 @,@ 063 @-@ metre (10 @,@ 049 @-@ foot) long Vilina Cave

. The proposed power plant is planned to have productive capacity of 68 megawatts . The project is to be financed in part through an European Bank for Reconstruction and Development (EBRD) loan in the amount of 123 @.@ 2 million Euros , approved on 22 November 2011 . Total project cost is estimated at 152 @.@ 4 million Euros . Pursuant to the European Union Habitats Directive , an additional assessment and a biodiversity management plan are required before the EBRD actually provides the approved funds . The documents should define any mitigating or compensating activities that might be needed .

The development project became controversial as environmental protection non @-@ governmental organizations (NGOs) drew public attention to a possible threat that may arise to seven species of bats . Subsequently , the NGOs alleged that the project is illegal , environmentally unsafe , financially not feasible , and technically questionable . Project legality was disputed because it is based on a 1999 environmental impact assessment (EIA) , while Croatian legislation requires that EIAs must not be more than two years old . Flooding of Vilina Cave is cited as an environmental concern , while the financial issues are based on previous cost overruns by Hrvatska elektroprivreda ? the state @-@ owned company planning the development ? in other projects . One objection to the technical aspects of the project is the possibility that the groundwater may trigger earthquakes . Opponents of the project have urged the Prime Minister of Croatia to cancel development of the plant .

After the elections of 2011 , Mirela Holy , who had declared her opposition to the project prior to the elections , was appointed Minister of Environment and Nature Protection . In 2012 the ministry commissioned four reviews of the EIA . The reviews ? one of them supporting the EIA and three disproving the conclusions of the original EIA ? were submitted to the Government of Croatia one day after Holy resigned her post , reportedly over an unrelated matter , on 7 June 2012 . Objections were raised by authors of the EIA that the reviews were not published and the names of the authors have been kept secret . Prime Minister Zoran Milanovi? said he wanted to collect opinions from the foremost Croatian , European , and worldwide experts before deciding on the matter , which has been under consideration since the early 1990s .

In May 2013 , the European Bank for Reconstruction and Development cancelled its proposed loan to the project , pointing at environmental concerns .

= = Etymology = =

In classical antiquity , the Ombla was a part of the river Arion , rising and sinking in present @-@ day region of Herzegovina before resurfacing at the coast . This is the earliest known name of the river , reported in Periplus of Pseudo @-@ Scylax . The most likely etymology of the river 's name is that it is derived from the Latin Vimbula , being named after vineyards , or Humbla , since the river was once in Zachlumia . Alternatively it is proposed that the name of the river descended from the Slavic word ubao or ubla , meaning a pit containing water , possibly a water well . Since the 16th century , the river was called Ombla or Umbla , or a variety of similar names which all translate as " River " ? Rika , Rieka , Ri?ina , and Rijeka . In the 19th century , the use of name Orion was also reported , apparently based on the Arion of the classical period . The word " Ombla " means sweet water from Albanian language