



# LIMNOLOGÍA 2023

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# SISTEMAS LÓTICOS



Servicios ecosistémicos



# Servicios Ecosistémicos



Moderación del clima  
Reciclaje de nutrientes  
Tratamiento de residuos  
Control de crecidas  
Recarga de acuíferos  
Hábitats para muchas especies  
Recursos genéticos y biodiversidad

Información científica  
Alimentos  
Agua potable  
Agua para cultivos  
Generación eléctrica  
Corredores de transporte  
Recreación



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# Restauración de arroyos y ríos





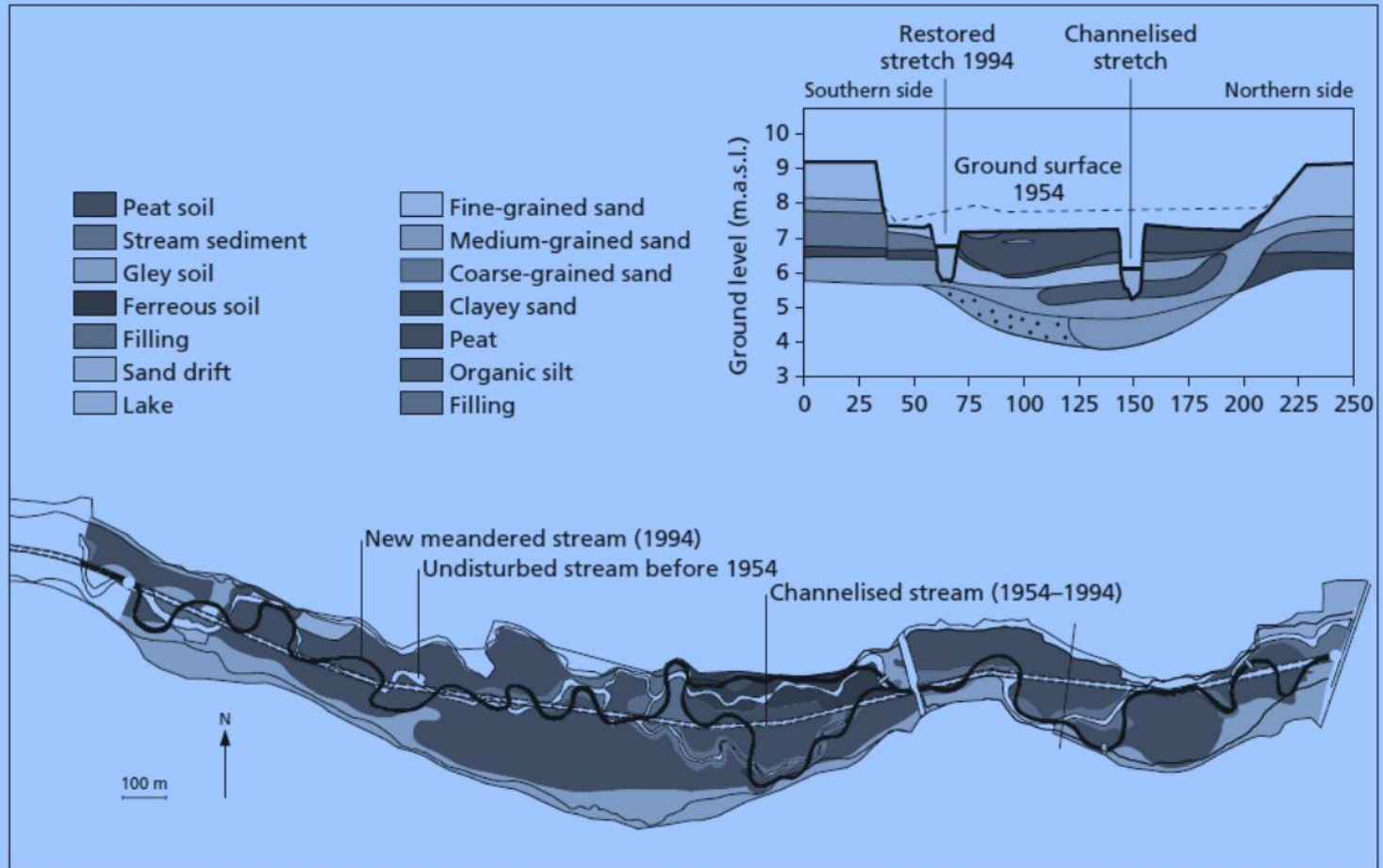
¿a qué escala?





# Restauración arroyos y ríos

Figure 1.3 The diversity of soil types in the river valley of the Brede Stream is considerable. The channel of this 4-km reach was re-meandered in 1994 in an initiative by the County of Southern Jutland. The river valley was drained and the river was channelised in 1954. Oxidation of the organic soil layer has caused a 0.5 m subsidence of the floodplain over the period of 40 years [2].



# 1.2 New channel meandering either side of existing channel

## RIVER COLE

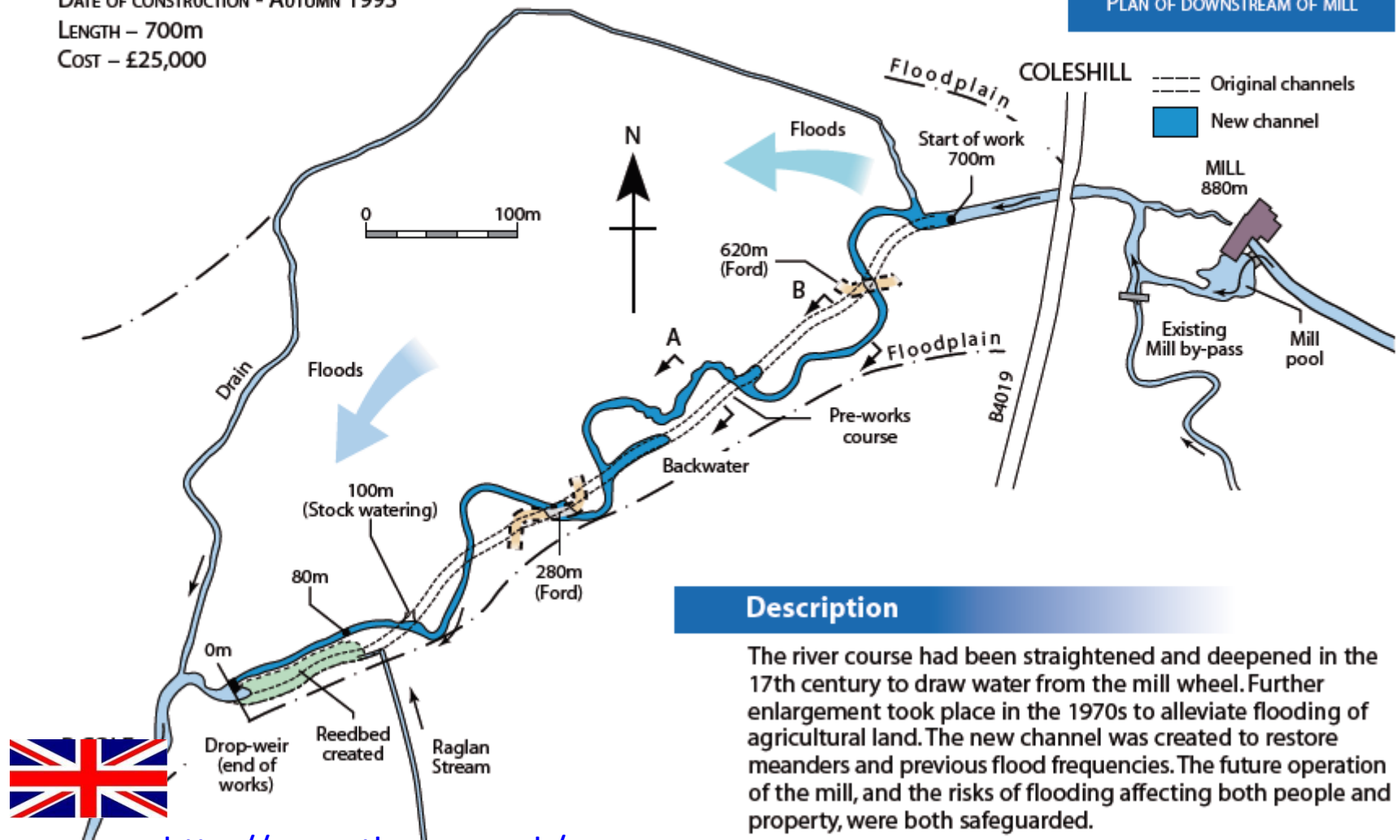
LOCATION - COLESHILL, (OXON/WILTS BORDER) SU234935

DATE OF CONSTRUCTION - AUTUMN 1995

LENGTH - 700m

COST - £25,000

**Figure 1.2.1**  
PLAN OF DOWNSTREAM OF MILL



### Description

The river course had been straightened and deepened in the 17th century to draw water from the mill wheel. Further enlargement took place in the 1970s to alleviate flooding of agricultural land. The new channel was created to restore meanders and previous flood frequencies. The future operation of the mill, and the risks of flooding affecting both people and property, were both safeguarded.





<http://www.therrc.co.uk/>



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# Skjern Enge



Skjern Enge byder på mange naturoplevelser året rundt. I Skjern Enge ønsker Skov- og Naturstyrelsen at forbedre levevilkårene for de mange forskellige planter og dyr, så oplevelsen for de besøgende kan blive bedst mulig. Derfor bedes du følge nedenstående regler.

- Hunde skal altid være i snor. I "Hundeengen" er hund uden snor tilladt.
- Hunde må ikke tages med i hegninger, kano eller båd.
- I fuglenes yngle- og træktid er der begrænset adgang i visse områder. Se skiltene.
- Overnatning på p-pladser i autocamper o.lign er forbudt.
- Overnatning i telt er kun tilladt på de afmærkede pladser.
- Bål og grill er kun tilladt på de afmærkede bål- og grillpladser.
- Sejlskuds uden motor er kun tilladt på de markerede strækninger fra 16.6 – 28. (29.) 2. Se signaturforklaring.
- Lystfiskeri på anviste åstrækninger er tilladt fra d. 1.4 – 14.9 med gyldigt nationalt og lokalt fiskekort.
- Lystfiskeri i åen fra Amholm Bro til Skjern Å og i Sydlige Parallelkanal fra den nordlige bred er tilladt med gyldigt nationalt fiskekort.

Høj vandstand kan forhindre færdsel på trampestierne.



Enjoy the wildlife in Skjern Enge all the year round. The Danish Forest- and Nature Agency wants to increase the biodiversity in the nature area. It will also increase the experiences for the visitors. Therefore the agency should kindly ask You to follow the rules mentioned below.

- Always have your dog in his lead. Use the "Dogarea" where dogs without lead are allowed.
- It is not allowed to bring your dog inside fences, in canoe or boat.
- In the bird's breeding- and resting periods certain areas can be closed.
- It is not allowed to stay overnight at the parking areas.
- Tenting overnight and open fire is only allowed at the marked areas.
- Canoeing is only allowed at the marked river stretch from 6.16 to 2.28.(29.) Look at the list of signs.
- For angling in Skjern River you must have a national fishing licence and local fishing card. Season 4.1 – 9.14.
- For angling at the river stretch from Amholm Bridge to Skjern River and from the nature area into Sdr. Parallelkanal you must have a national fishing licence.

High water level in the area can prevent You from walking on the tracks.



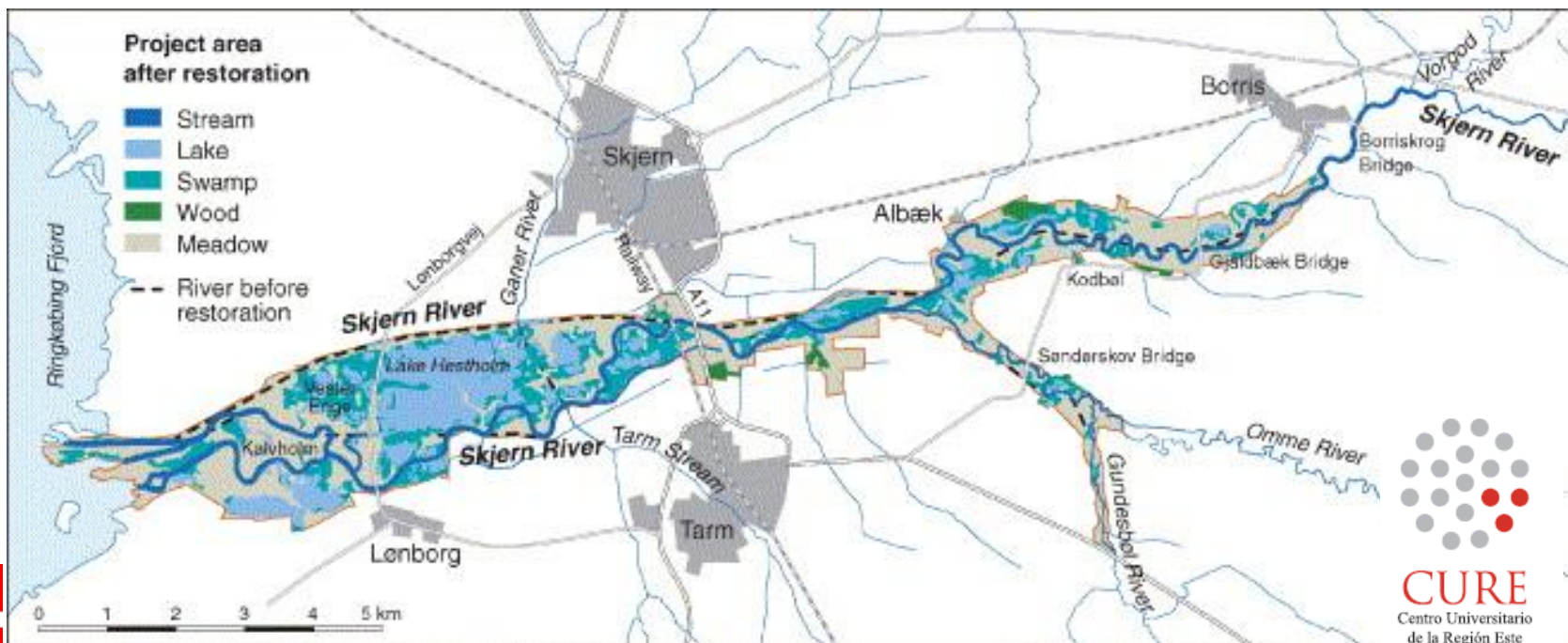
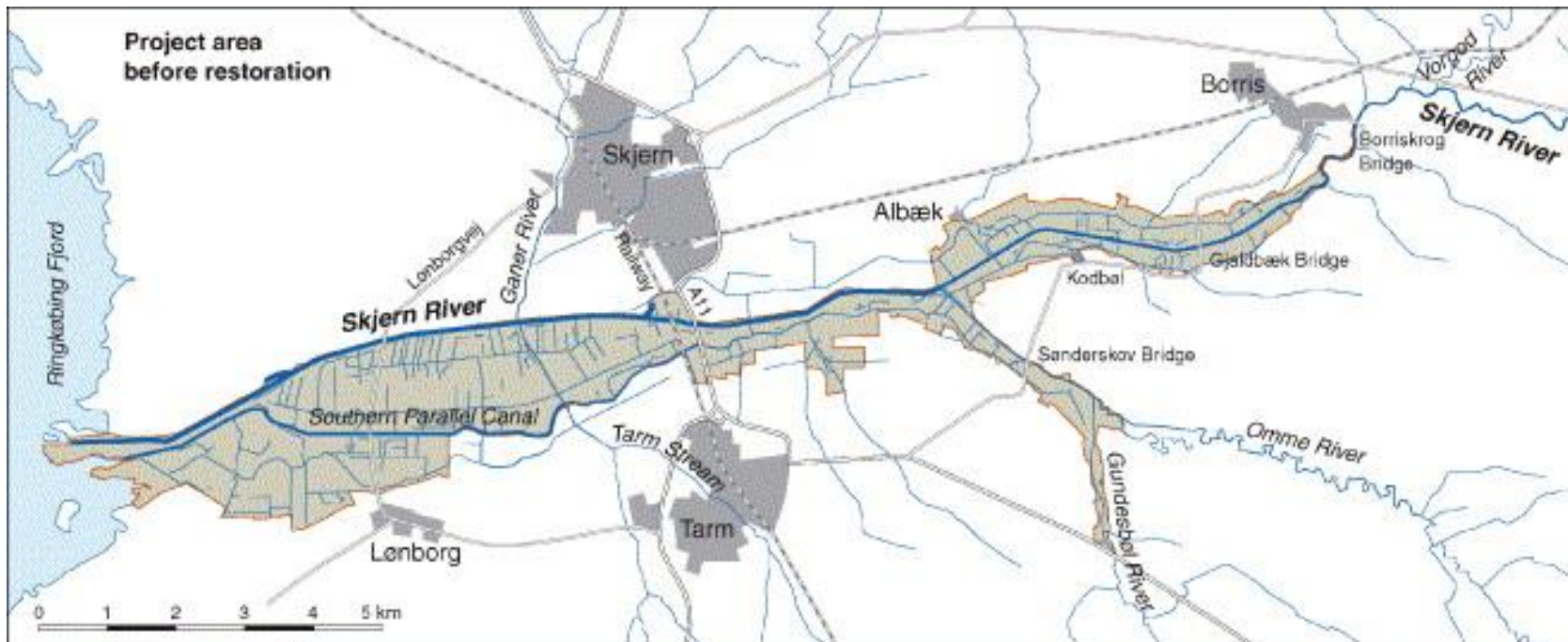
Skjern Enge bieten das ganze Jahr über viele Naturerlebnisse. Dänisches Generaldirektorat für Forst und Natur wünscht eine große Biodiversifikation in diese Naturgebiet. Es gibt auch großen Naturerlebnissen für die Besuchern. Deshalb das Generaldirektorat bitten Sie folgende regeln beachtet werden.

- Den Hund immer an der Leine führen. In der Hundgebiet können Hunde ohne Leinen laufen.
- Hund in die Umzäunungen, in Kanus, oder Boote ist verboten.
- In den Brut- und Zugzeiten der Vögel kann es in bestimmten Gebieten einen eingeschränkten Zugang geben.
- Das Übernachten auf dem Parkplatz ist verboten.
- Das Übernachten im Zelt, Feuer und Grill ist nur an den markierten Plätzen gestattet.
- Kanufahren ist nur in Skjern Au von 16.6 bis 28.(29.)2. an den markierten Austrecke erlaubt.
- Das Angeln in den Skjern Au erfordert ein gesetzliches Angelzeichen und auch ein lokal Angelkarte.
- Das Angeln in den Au von Amholm Brücke zum Skjern Au und in Sdr. Parallelkanal von der Naturgebiet erfordert ein gesetzliches Angelzeichen.

Nicht alle Fußwege sind zu Betreten, wenn der Wasserstand ist hoch in dem Naturgebiet.

- Eng / Dry meadow / Trockene Weiden
- Våd eng / Wetland / Feuchtwiesen
- Våde områder / Marsh / Feuchtbioptop
- Se / Ponds / Seen
- Hede / Heathland / Heide
- Adgang ikke tilladt / Access is not allowed / Zutritt nicht erlaubt
- Cykel- og gangsti, kørestolegnet / Bicycle and footpath, suitable for wheelchairs / Weg für Fahrrad, Fußgänger und Rollstuhl
- Almæretet ridesti / Briede path / Reitweg
- Trampesti / Tracks / Trampestplad
- Bro / Bridge / Brücke
- Træktunge / Rops ferry / Seiltåre
- Sejlskud tilladt / Canoeing allowed / Kanufahren erlaubt 16.6. – 28(29) 2.
- Sejlskud forbudt / No admittance for boats / Canoes / Segeln mit Boot und Kanu ist verboten
- Parkering / Parking area / Parkplatz
- WC / Toilet / Toilette
- Vand / Water / Wasser
- Naturcenter og udstilling / Nature center and exhibition / Naturzentrum und Ausstellung
- Infotablet, infotavler / Infotablet, info signs / Infotablet, Infotafel
- Fugleskjul, udsigtstorn / Bird hide, viewing platform / Vogelbeobachtungshütte, Aussichtsturm
- Overnatningsplads med shelter / Simple camping and shelter / Primitive Übernachtung und Shelter
- Opfæringsplads / Slipway for canoe / Kanuschiene
- Fiskeplads for gangbesværet / Angling suitable for disabled / Behindertengerechtes Angelplatz
- Hundeeng / Area for dogs / Hundgebiet
- Borde og bænke / Picnic area / Rastplatz
- Opfæringsplads / Barbecue area / Grill in freien
- Grillhytte / Barbecue hut / Grillhütte
- Madpakkehushus / Covered picnic area / Rastplatz überdacht
- Her står du / You are here / Sie stehen hier









Pedersen et al, 2007. Restoration of Skjern River and its valley: Project description and general ecological changes in the project area. *Ecological Engineering* 30(2):131-144

















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# Recuperación de microhábitats









# En el otro extremo



**Hayden Clarkin**

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In 2001, Seoul's new mayor, Lee Myung-bak promised to restore the Cheonggye Creek after it was sealed over for an elevated freeway in 1968. Since its removal, 500,000 people each week visit the 9km of river and greenery in the heart of the city.



11:32 AM · Feb 6, 2023



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## River restoration with highway removal

In megacity Seoul, Korea, the restoration of a culturally important river teaches key lessons. A river can be recovered and restored even in a large and dense central business district, with multiple positive effects. These include providing habitat for nature, preserving cultural heritage, providing access to nature for the public, flood control, and microclimate regulation. The river restoration also promoted more sustainable transport forms over roads and cars removed to make space for the river and its surrounding parks.



## **Many benefits to environment**

The environmental benefits of the restored river are multiple. Air quality improved: one report cites small-particle air pollution decreasing from 74 micrograms per cubic metre to 48 in the vicinity of the river. Microclimate benefits come from the river acting as a natural air-conditioner: temperatures in the river corridor are 3-4 degrees C lower than areas only 400 metres away, and wind speeds are on average 50% higher than before the river was recovered. These are important benefits for climate adaptation, in addition to the increased resilience against flooding when a city has open watercourses.

The natural ecology has benefited, e.g. birds, fish, insects, and plants. According to a 2009 report, the number of bird species in the river corridor increased from 6 to 36, fish species from 4 to 25, and insect species from 15 to 192. The green corridor is eight km long and 730 metres wide, with a 400 ha park, and features waterfalls, bridges, and running tracks.







Cheonggyecheon, Seoul (Korea)



### **Critical questions**

There are remaining critical questions about the sustainability tradeoffs when pumping water artificially to a newly restored river. Critics of the river restoration question the overall benefits to citizens quality of life and whether the process had sufficient input from civil society and environmental actors.







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