



The Isar River in Munich: lost and regained

Nico Döring, Die Umweltakademie e.V. München

Nature and Emotion in Urban Landscapes, Seoul 06-2014

Lower Isar
lowland character, meander
to the estuary into the Danube

Middle Isar
former braided River with gravelbars,
transportation of bedload,
alpine character

Upper Isar
from the Alps, high erosion, source of
gravelload





**The Isar in the Alps
Near the source**

**The Isar River
as a braided river
from the Alps 100 km
down to Munich**

**until its transformation
in the 20th century**

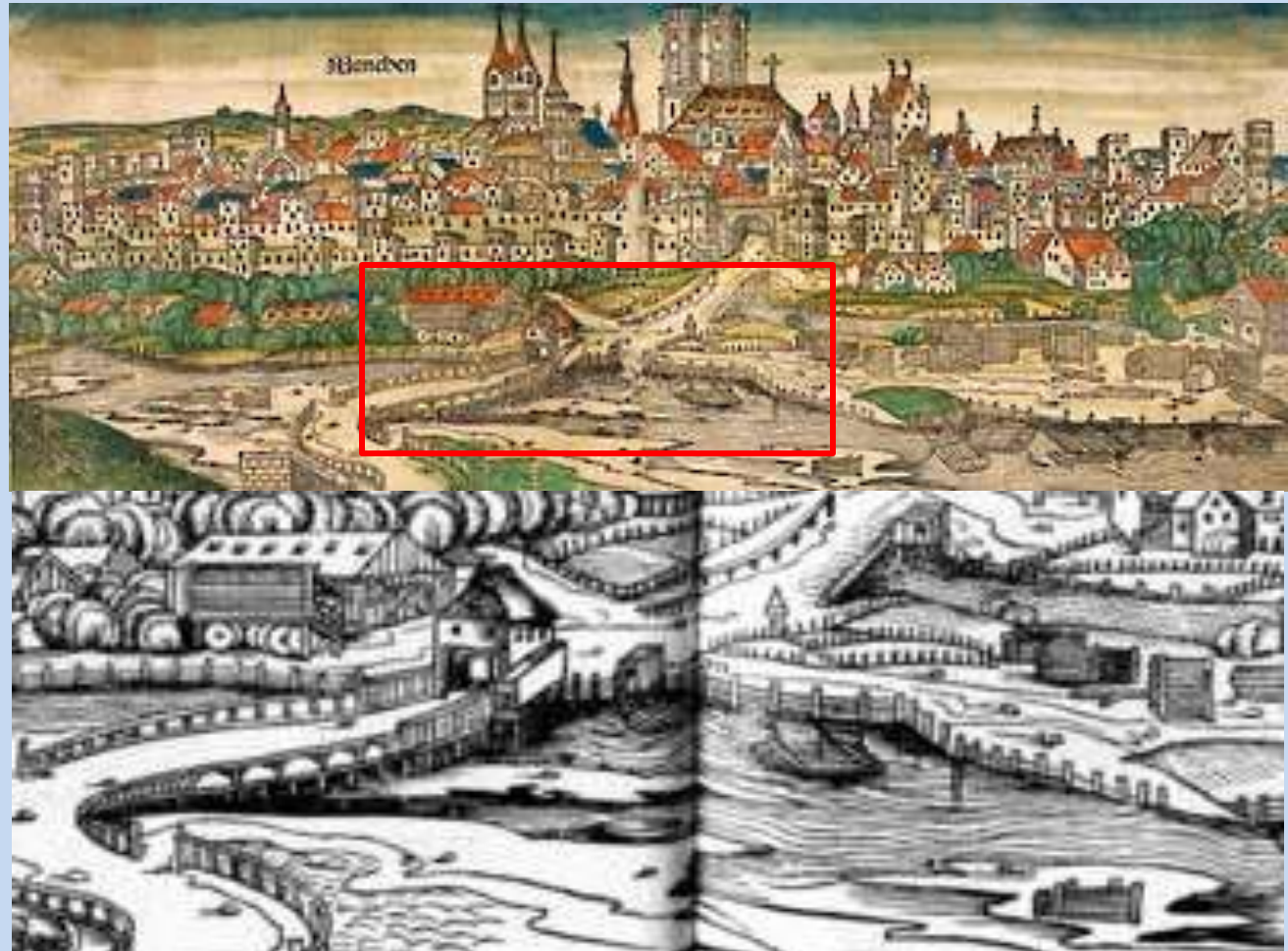


Munich after 15. century

**Widespread natural
riverbeds**

**Multifunctional use of the
Isar River**

**The Isar River was a
central axis for economy
(Transportation by rafts,
water mills,
natural resources)**



**Women collecting lime stone
in the wide riverbed**

„Kalksteinsammlerinnen“

Joseph Wenglein 1883



1870

**Isar River near Munich,
still in its natural shape**

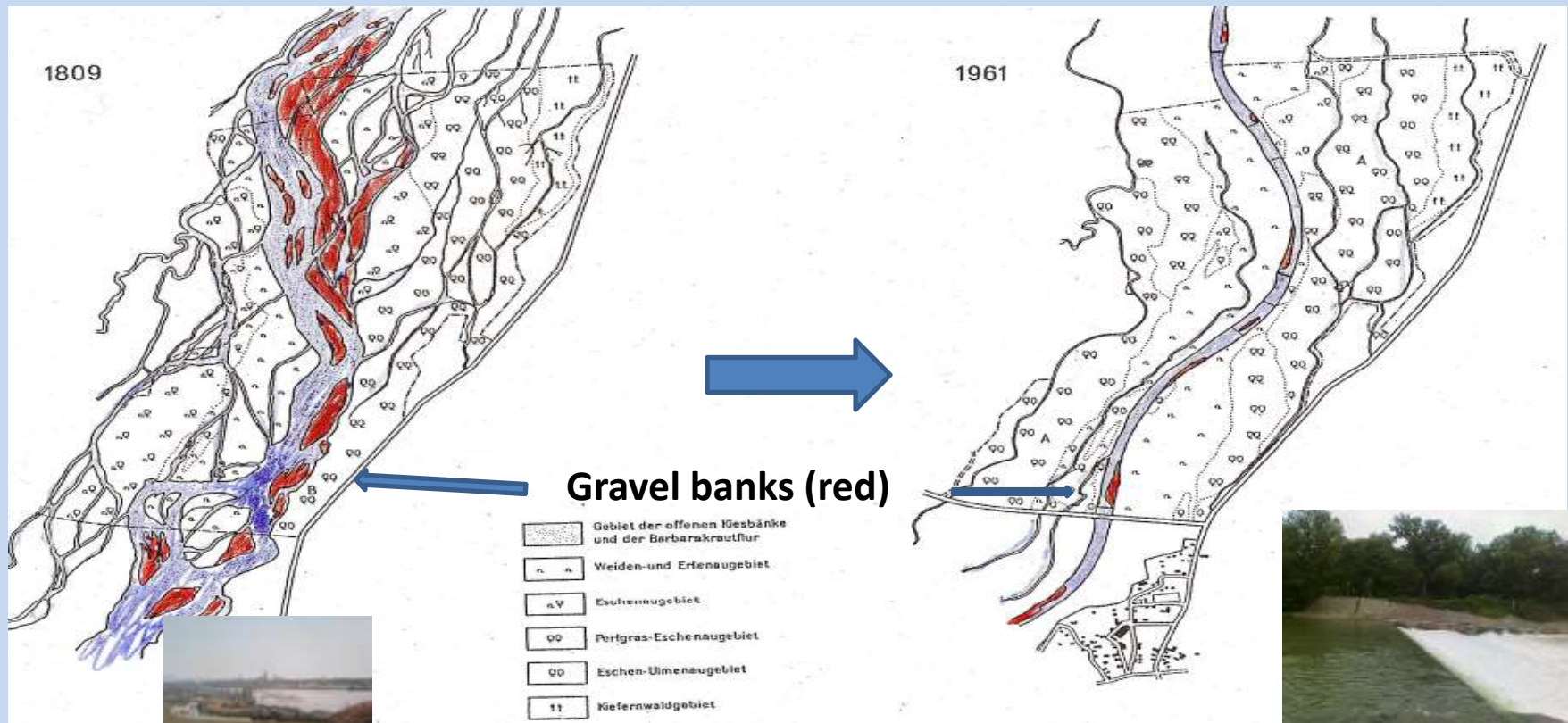


**Munich
Flood water
catastrophe:
the bridge is gone...**





Destruction of the Ludwig's bridge in 1813



A braided river 1809



A canalized river 1961

The Transformation of the Isar River

**The Isar river before
taming and canalizing
measures**

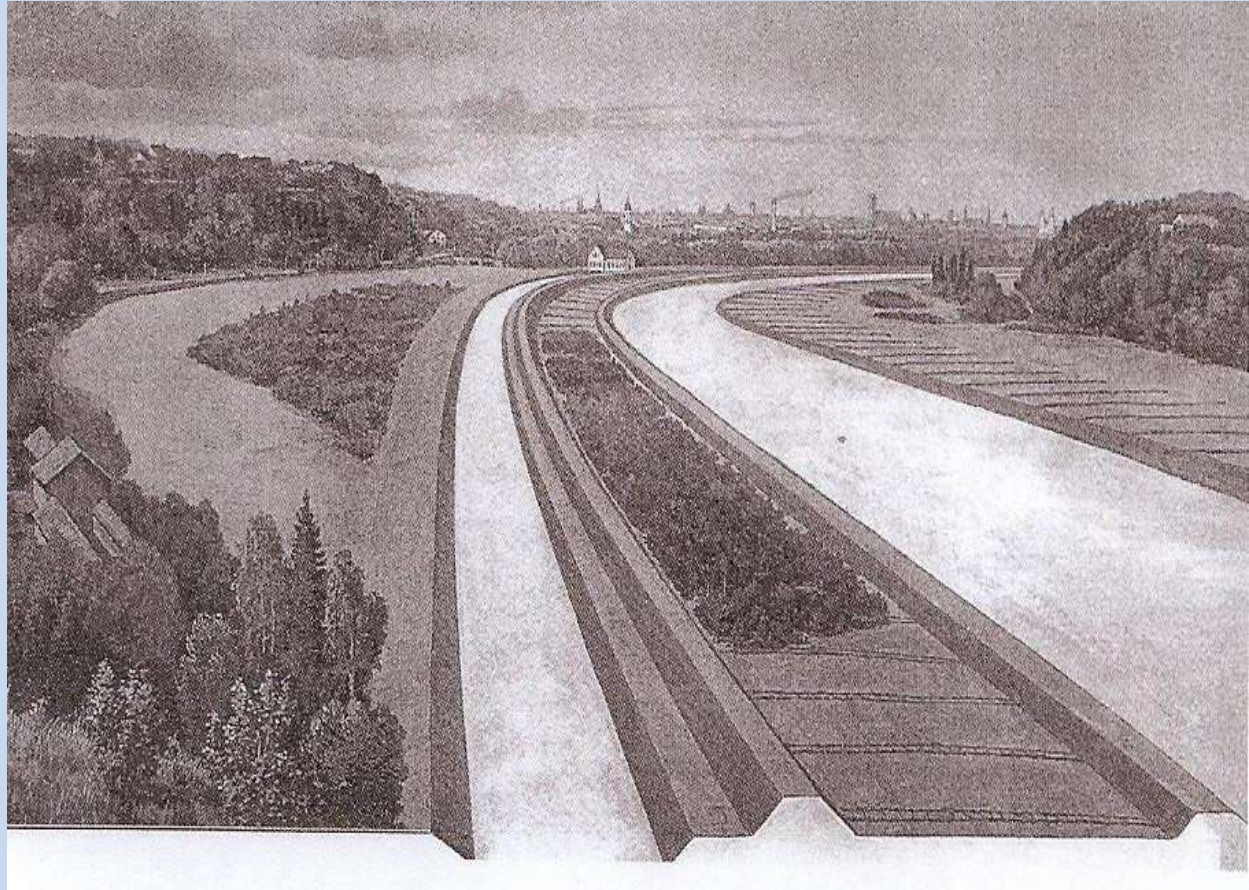
Munich 1902



Munich 1902

**The new plan for taming
the river and for
hydro power canals**

**First dams for flood
protection**



**1906 the Isar River
in Munich was tamed
and most of the time
nearly dry.**

**A canal beside the river
guided the water to
new hydro power
plants.**

**After 1925 nearly the
whole river became
regulated and tamed.**



**Weirs and walls
were necessary for
limiting the erosion and
deepening of the river.**

**They interrupt
the river.**



**The Isar in Munich
after 1906**

**The river is eroded.
Walls inhibit the
contact to the river.**



The Vision

nature and leisure activities



The Vision

clean water and gravel banks



The Vision

animals and plants still
living in the Alps



The Vision

a small relict near Munich



The Vision



Desire in Munich:

The Alps

Touch to Nature

Birds

Fish

Butterflies

Alpine Plants

Mountain Water

Stream Sound

Isar Power

Leisure Time



Vision: From an utopy to a new guiding principle

Feel free to dream in contact with the nature , even if it seems to be an utopy.

Formulate your vision.

Recognize the potentials of the nature with people, even if they are far away .

Define all deficits, talk about your vision, do first steps and start networking.

Integrate people who enjoy and get touched with the nature.

Knowledge about the nature is a motor for qualified measures.

Integrate measures for nature restauration in every plan, step by step.

**This relict of the Isar River
in Munich served as an
example
for the new
guiding principle of
the urban Isar River**



The Chance :

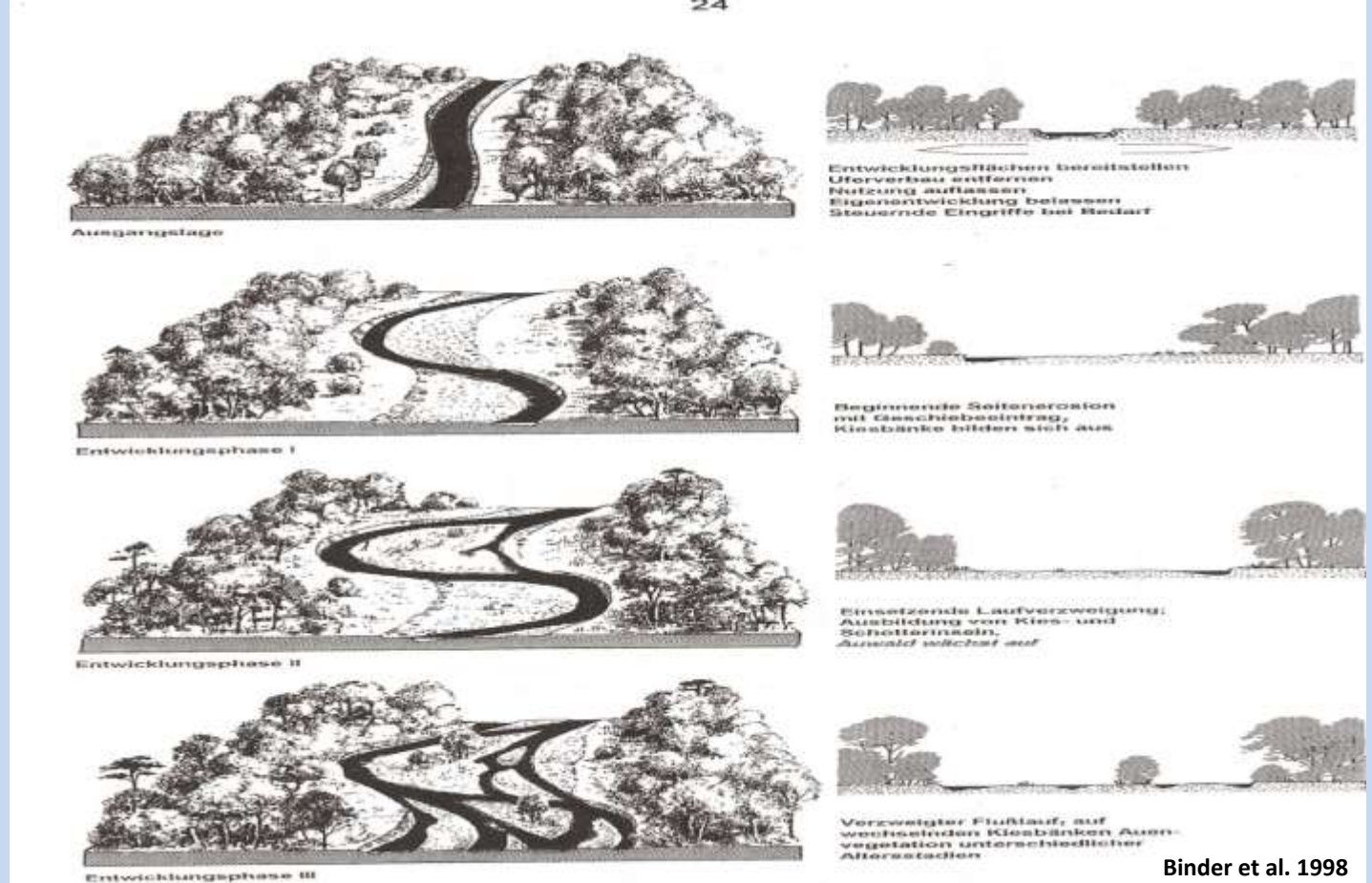
**Necessary measures
for flood protection
and expiring licences
for hydro power plants
were a welcome
opportunity.**

**They were combined
with new guiding
principles.**



Measures of Revitalisation with an Industrialized River

Goals of revitalisation



The Isar Revitalization

- 1988 General discussion and decision for sustainability at the Isar river.
- Activities with exhibitions, excursions and media information.
- 1994 First decision for the rural river restoration (Mühlthal near Munich 10 kilometers of the river)
- 1995 Second decision for the first urban restoration in Munich with flood protection, nature and leisure areas. (Isarplan Munich beginning 1998, finishing 2011 7 kilometers in the city)
- 1996 First decision for sewage plant improvement (26 sewage plants)
- 2000 First gravel load management concept

The Isar Restauration I (Mühlal 10 km)

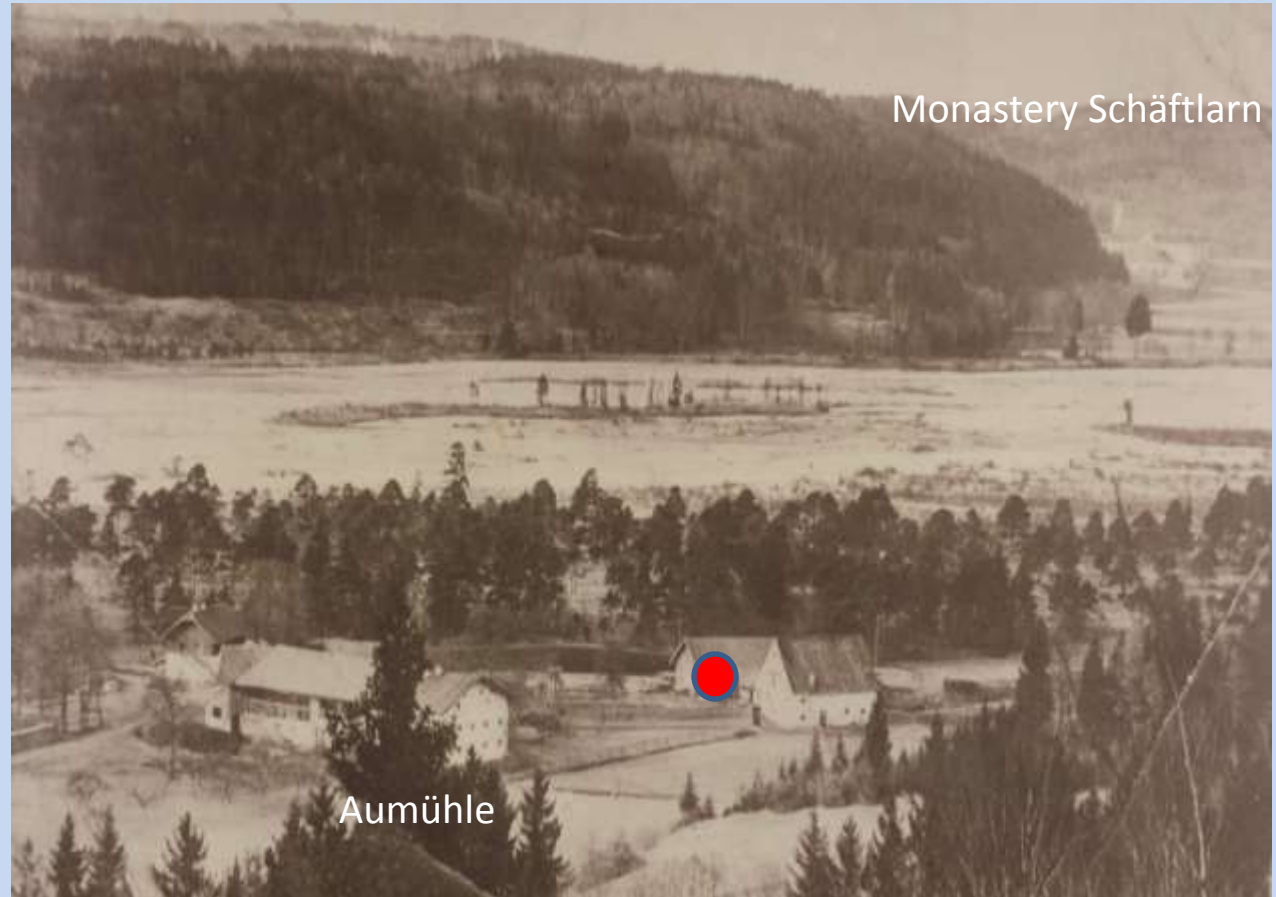
- 1992 Discussion about rules for new permissions for old hydro power plants at the Isar River
- 1994 First paradigmatic new permission (for the next 30 years) connected with the decision for the first rural river restoration (Isar in Mühlal near Munich)

Isar Mühlal



Aumühle um 1925

1900
The original
Isar River



Monastery Schäftlarn

Aumühle

Aumühle, about 1900

1925

**After building a
canal:
Nearly dry river**



**New canal to the
hydropower plant**



Monastery Schäftlarn

Aumühle

Aumühle, about 1925

**Canalized river,
partly revitalized**



Hydro power canal



www.rent-a-drone.de



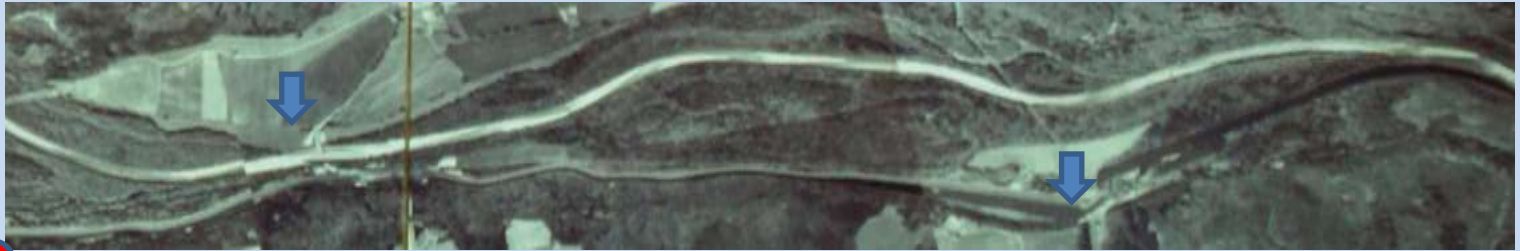
Monastery Schäftlarn

Aumühle, about 2012

1925:
Natural Isar
with the newly
constructed
hydro
power Canal



1988:
Tamed Isar
Canal



2012:
Newly
less tamed Isar
Canal



First Rural Isar River Restoration Project near Munich (Mühlital)





The Isar Restauration II (in Munich 7 km)

1992 Discussion about new flood protection measures at the Isar River in Munich

Alternatives :

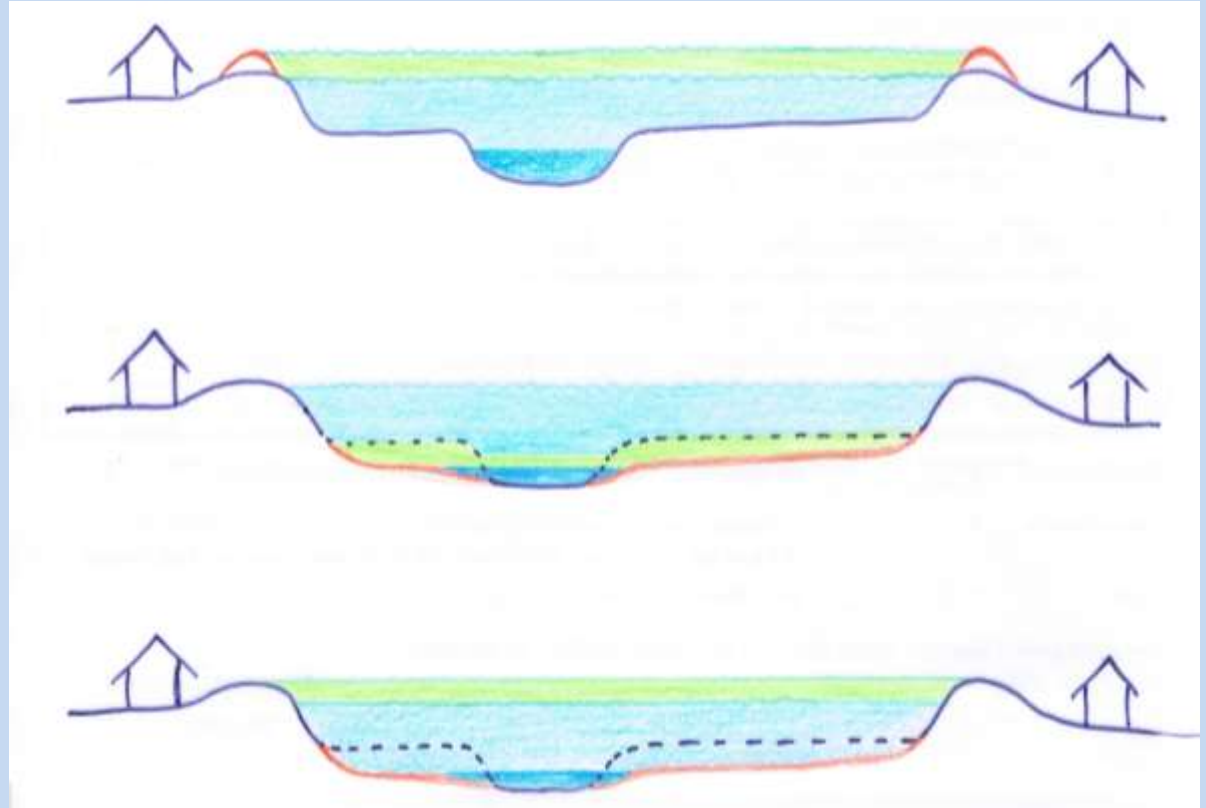
- conventional concept with new high dams and dykes for flood protection
- integral solution with a widened river bed, low alluvial zones and small additional dams for flood protection, nature restoration and leisure areas

Two alternatives for extended flood protection in Munich

Former solution:
new high dams

or

Integral solution:
a widened river bed,
lower alluvial zones,
small additional dams for
flood protection,
nature restoration,
leisure areas



Economical, ecological and social aspects completed the Isar Plan

- New measures for flood protection in combination with river restoration and leisure areas
- New riparian gravel structures instead of linear concrete dykes
- New dynamic habitats with changing shorelines instead of hard inaccessible canalized structures
- Reshaping a new polyfunctional river with social meeting areas at the rivershores instead of a monofunctionally hydropower optimized river



Tamed Isar after 1906



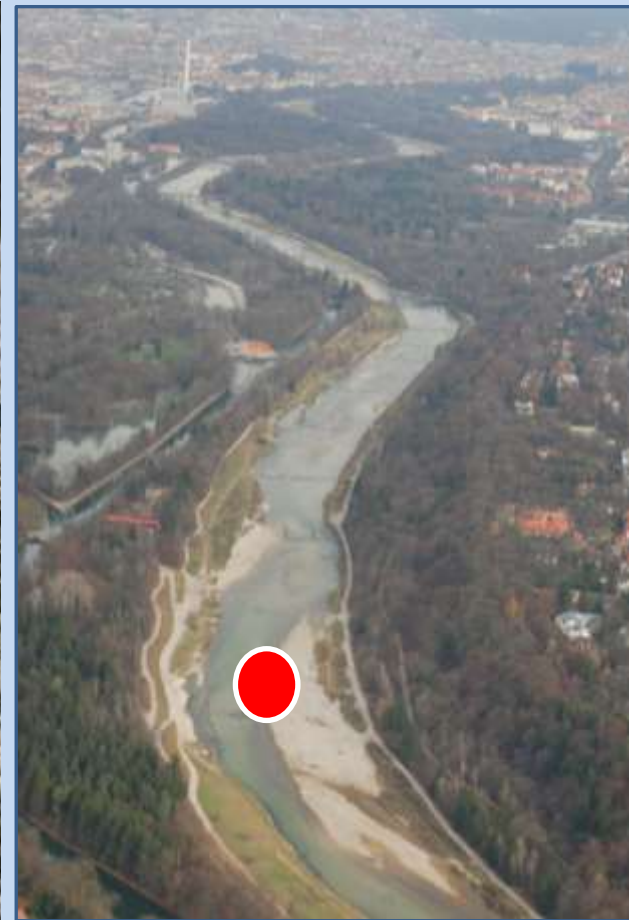
Vision Isar Plan 1995



Isar in Munich 2011



Dialogue during remodeling of the shore 1998



Result 2011

Isar River Restoration in Munich city:

**Still canalized river
near the new
willow island and
Deutsches Museum**

2011



**The new nearly
finished Isar River**

**Only the right side
was modified with
dynamic gravel
shores**

2011



Willow Island



In the city:

**The left side
remained canalized,
the right side was
remodeled.**

**It animates to land art
activities**





Picnic at the river is the new attraction

Facts

From the idea to the decision	Isarplan Munich 1995 - 1998	Isar Mühlthal 1992 - 1994
Realisation	1998 - 2011	1994 - 2001
Distance	8 kilometers	10 kilometers
Money	35 000 000 €	3 000 000 €
Old material	- 700 000 m ³	old concrete was shreddered and added again to the river
New stones	+ 385 000 t urban measures, flood protection, leisure, nature	recycling of old stones no flood protection

The quality of restaurations is dependant of scientific knowledge and the dialogue between all disciplines:

Measures for flood management

Water quality and sewage plants

New habitats for animals and plants

Water management (hydropower, flood, and dry periods)

Gravel load and sediment management

Reactivation of the connection of the river to the groundwater exchange

Agriculture measures (avoiding fertilizers in the river)

Leisure activities (area management, information, regulations)

Urban biomanagement

Urban rain water management and retention

Citizen Involvement



Title	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PARTICIPATION GOAL	To provide the public with objective information	To obtain public feedback	To work directly with the public throughout the process	To partner with the public in each aspect of the decision	To place final decision-making in the hands of the public
ORGANIZED STAKE-HOLDER GROUPS	<ul style="list-style-type: none"> ■ Fact sheets ■ Newspaper articles ■ Web sites ■ Exhibition 	<ul style="list-style-type: none"> ■ Town meetings ■ Public comments 	<ul style="list-style-type: none"> ■ Panel of experts ■ Workshops 	<ul style="list-style-type: none"> ■ Competition for urban section ■ Mediation 	
INDIVIDUAL CITIZENS	<ul style="list-style-type: none"> ■ Fact sheets ■ Newspaper articles ■ Web sites ■ Exhibition 	<ul style="list-style-type: none"> ■ Town meetings 	<ul style="list-style-type: none"> ■ (Panel of experts) 		

Gravelload

Near the source:

**origin of
gravelload**

**North Alps, Austria,
Tyrol**



Sylvenstein dam lake: end for the bedload

**Bedload barrier
100 000 m³/a**

Floodprotection

Hydropower

**Water addition in
dry periods
(sewage plants)**



**Missing of bedload
below the dam
led to imbalance:
Erosion of the river
sole – the Isar River
dropped between
two and eight
metres.**

**First photo:
1 kilometre down
the Sylvenstein dam**



**Second photo:
35 kilometres down
the Sylvenstein dam**

**The Isar River has
dropped about
3 metres and is
reduced to one
gorge.**



**Third photo:
70 kilometres down
the Sylvenstein dam
the Isar River has
dropped about 8
metres and
is reduced to one
gorge.**

**Isar in the north of
Munich near Freising**



**45 kilometres down the
Sylvenstein dam:**

**the barrage Ickinger
Wehr locally prevents
further dropping down
in the upper course**

**near the barrage the
river is technically
formed like a canal**

**Isar river is a patchwork
of canal and nature**



Gravel load concept

Here the gravelload is transported by lorry

At other places at small dam lakes it is flushed down



Sylvenstein
stausee

Measures for gravel load transport



**After a flood period
the river shore is
covered with new
fine gravel from the
Alps**



Water quality

Landart

Usually bathing water quality after optimizing 27 sewage plants







Public Land art events at the new Isar river shores Title: How to make the wind visible

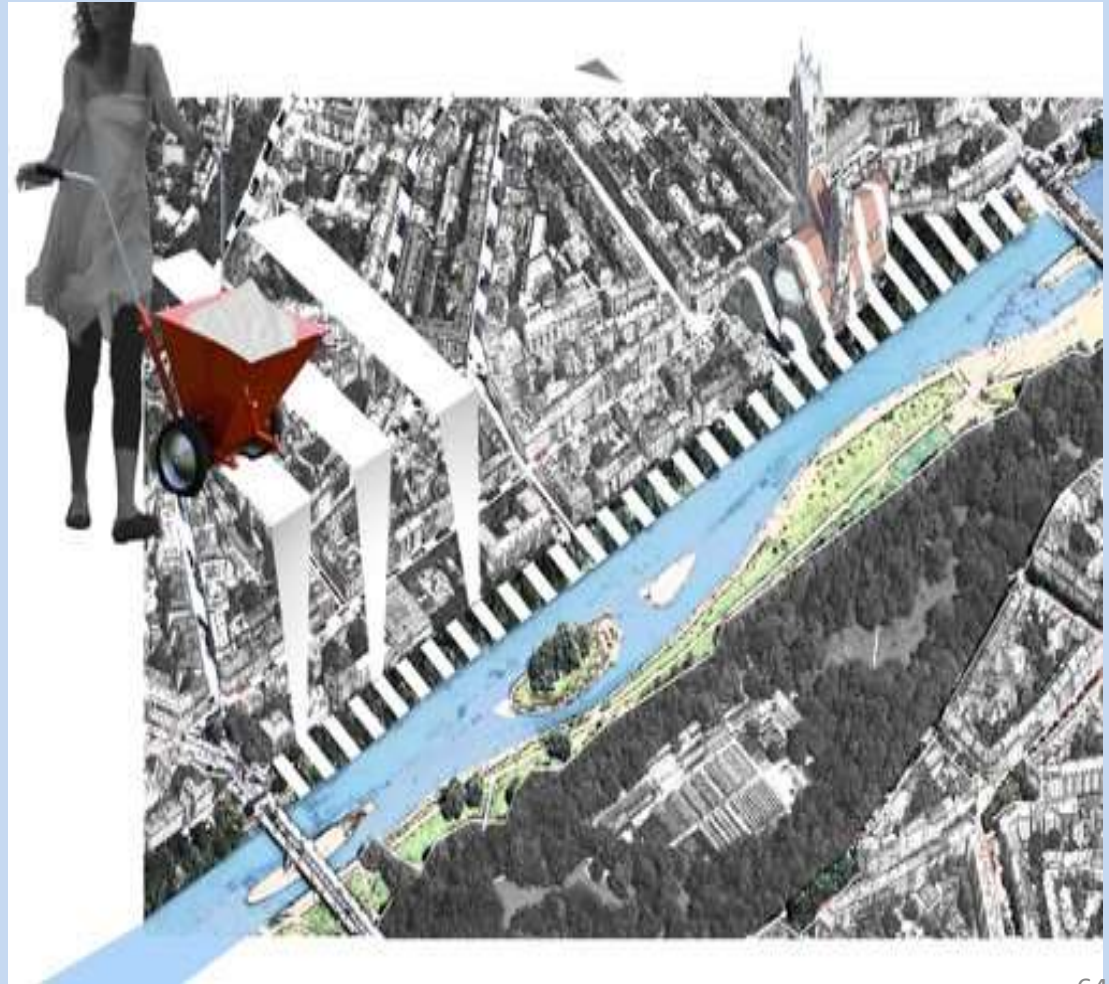


**People start to be
creative at new river
shores**



A new step 2013

This Isar River tangential street for two weekends was modified to a boulevard for pedestrians





Urban sporting activities at the Isar River during a flood event



Urban sporting activities in a Isar side canal; during flood the water is grey



Thank You for your attention
Nico Döring, Die Umweltakademie München