

# Integrated Masterplan

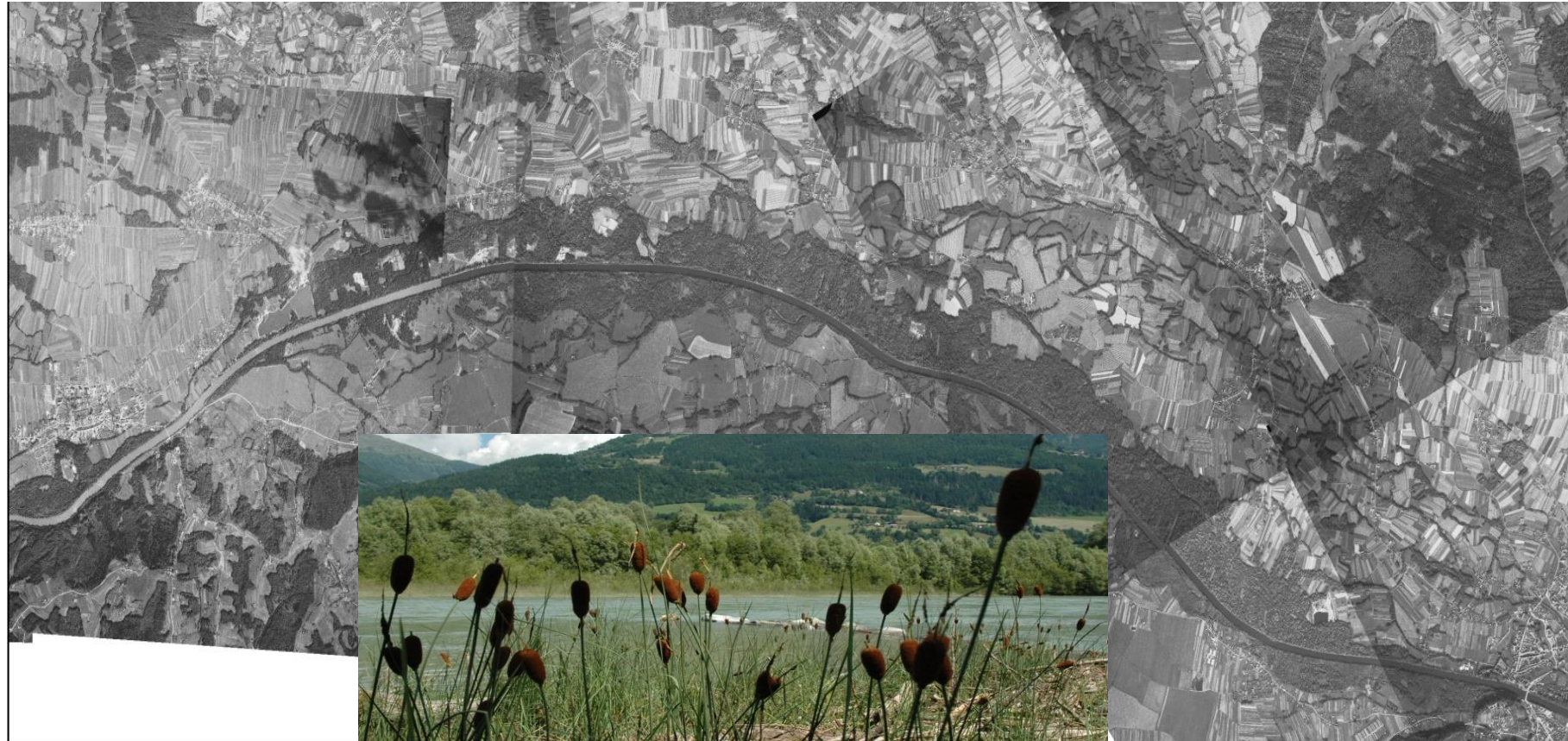


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1960: *Typha minima*...



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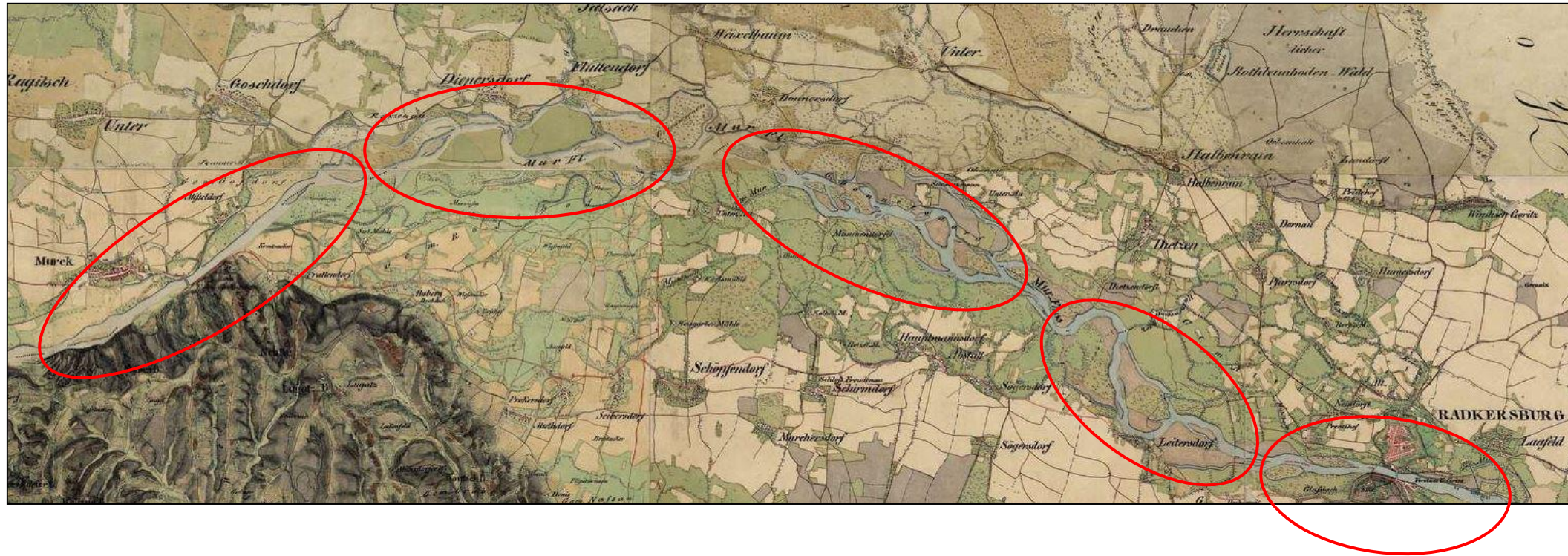


# 1830: One river – various faces

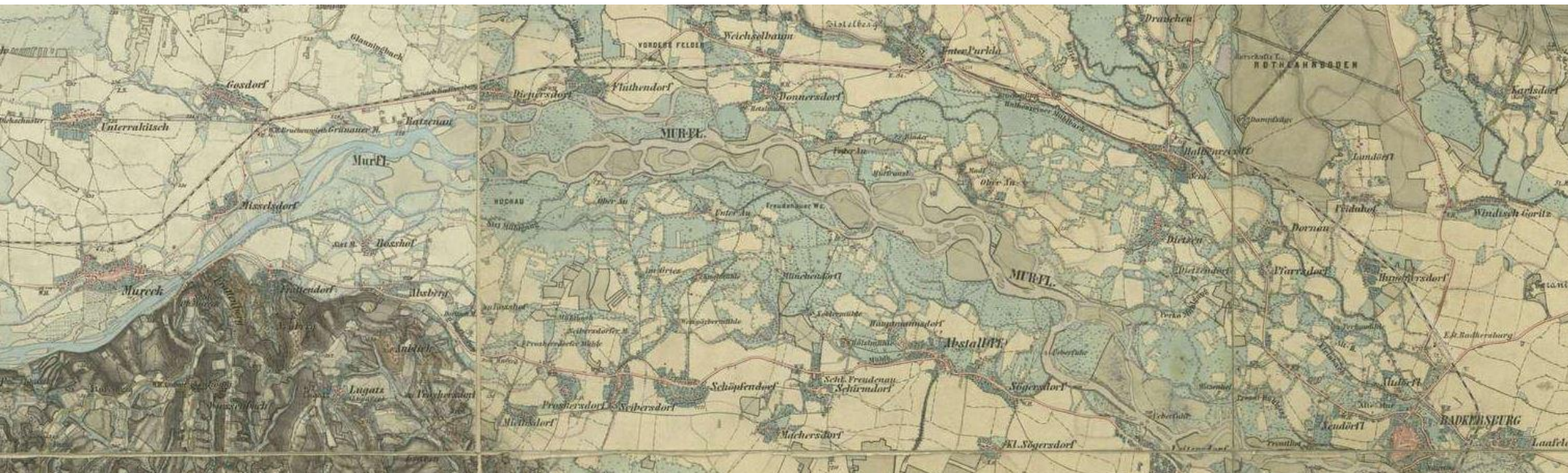
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# 1880



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2018



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# Sediment input reduction

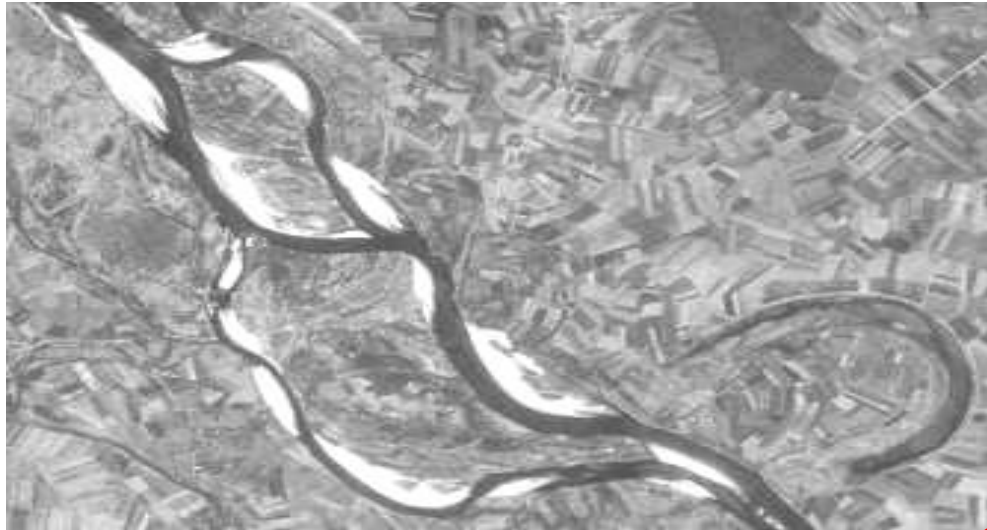
## River engineering structures

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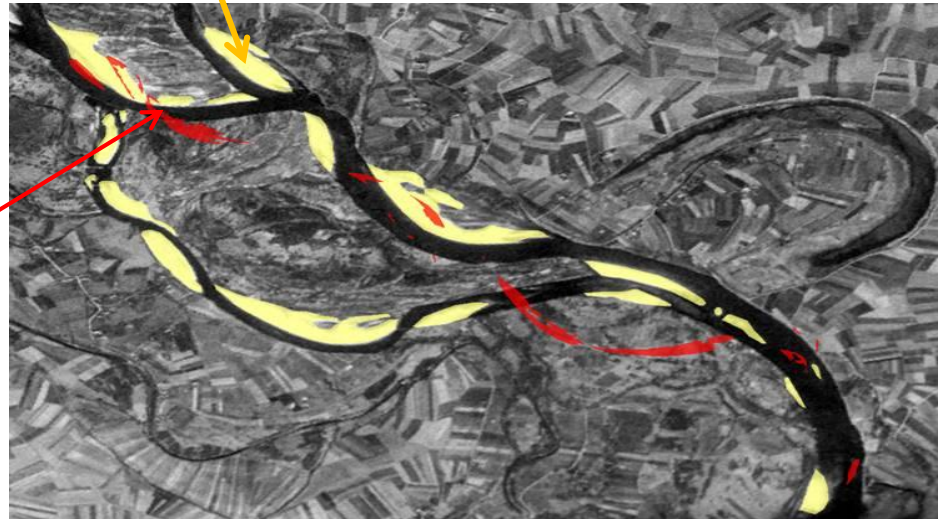
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**2015** red

**1965** yellow



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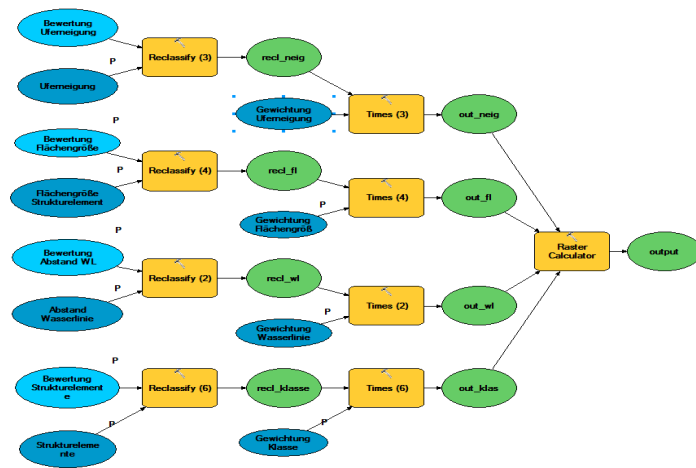
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**80% gravel bank loss – almost solely due to lack of sediment input!**



# Sediment input reduction

## Limited lateral erosion and limited morphodynamics



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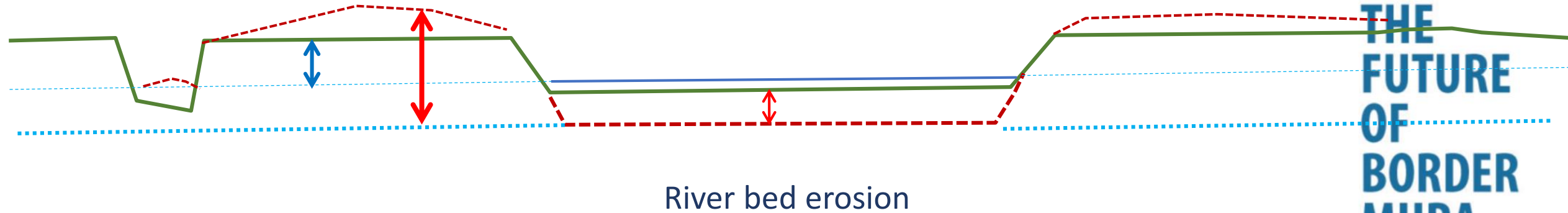
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SEDIMENTATION

SEDIMENTATION



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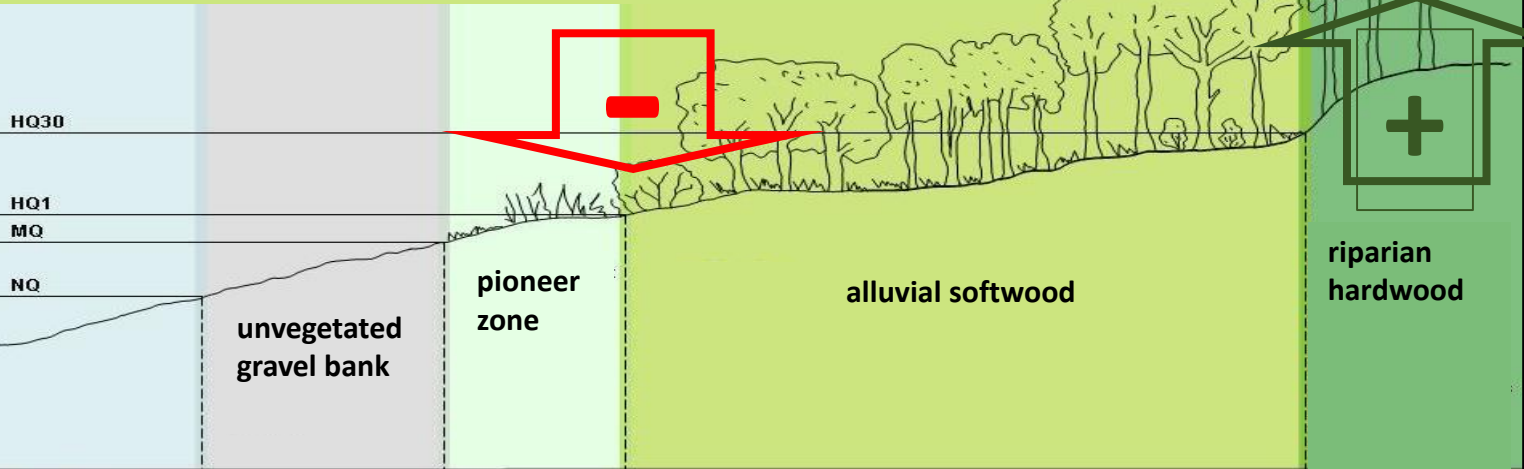
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**Falling ground water level**  
**Increasing sedimentation within inundation area**

**Trend → Alluvial habitas decoupling from river**



Parameters of semi-aquatic and terrestrial habitats  
Vegetation zones



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**Sharp decrease in gravel banks,  
pioneer sites, riparian softwoods, side  
arms...**



# Conclusion



## Sediment & Space



essential prerequisites for river restoration  
and Natura 2000 management



see

**PWMC 2001 (Phase I)**



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# Examples:

## Border rivers & Natura 2000 areas

Drava

Salzach

Lech

Alpine Rhine

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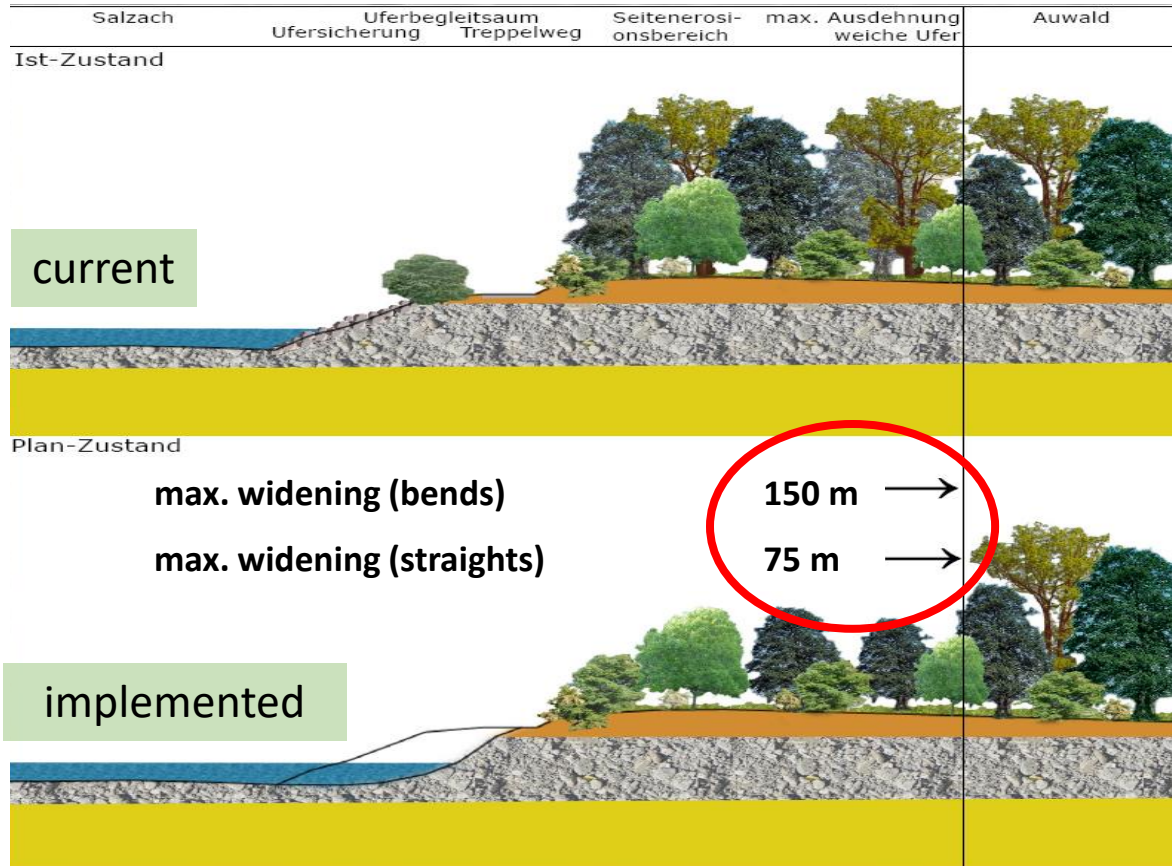
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# Salzach

## “soft” banks and ramp



- widening potential: 75–150 m
- “soft” banks → sediment input

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# Drava

## Side arm system initiates lateral erosion



Bestandsaufnahme Flug v. 20.Okt.2009



Baufortschritt Flug v. 20.April 2011

### Widening Obergottesfeld



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# Drava: Initial Channel



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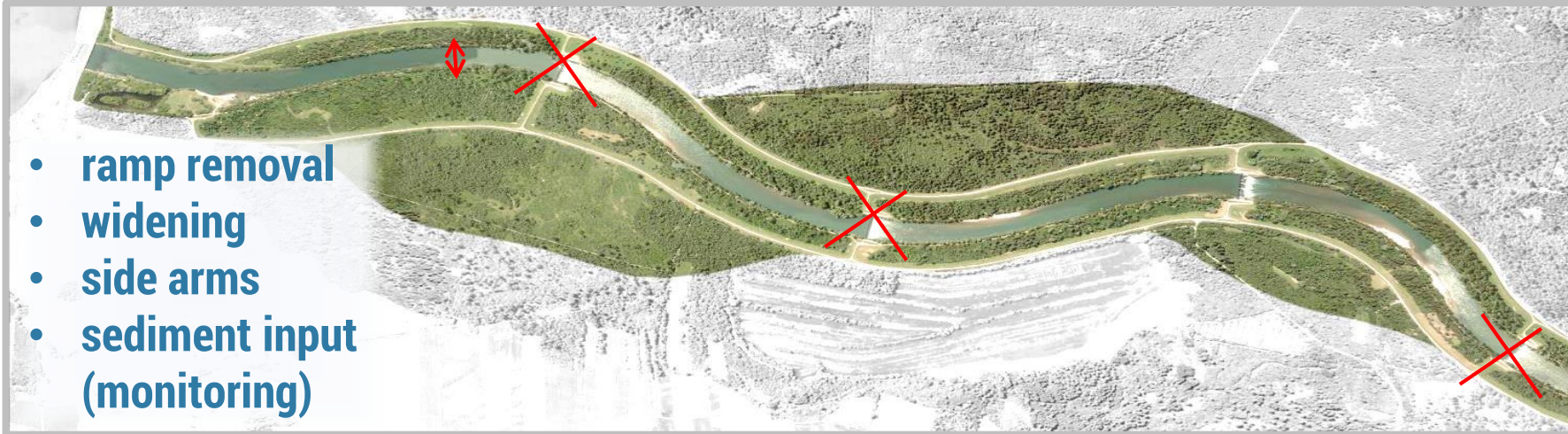
# Lech:

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- ramp removal
- widening
- side arms
- sediment input (monitoring)



# Alpine Rhine:



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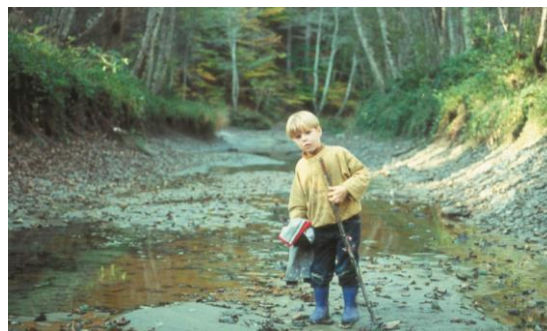
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**Widening of discharge profile and bed load management**



# Challenge: Integrated Masterplan

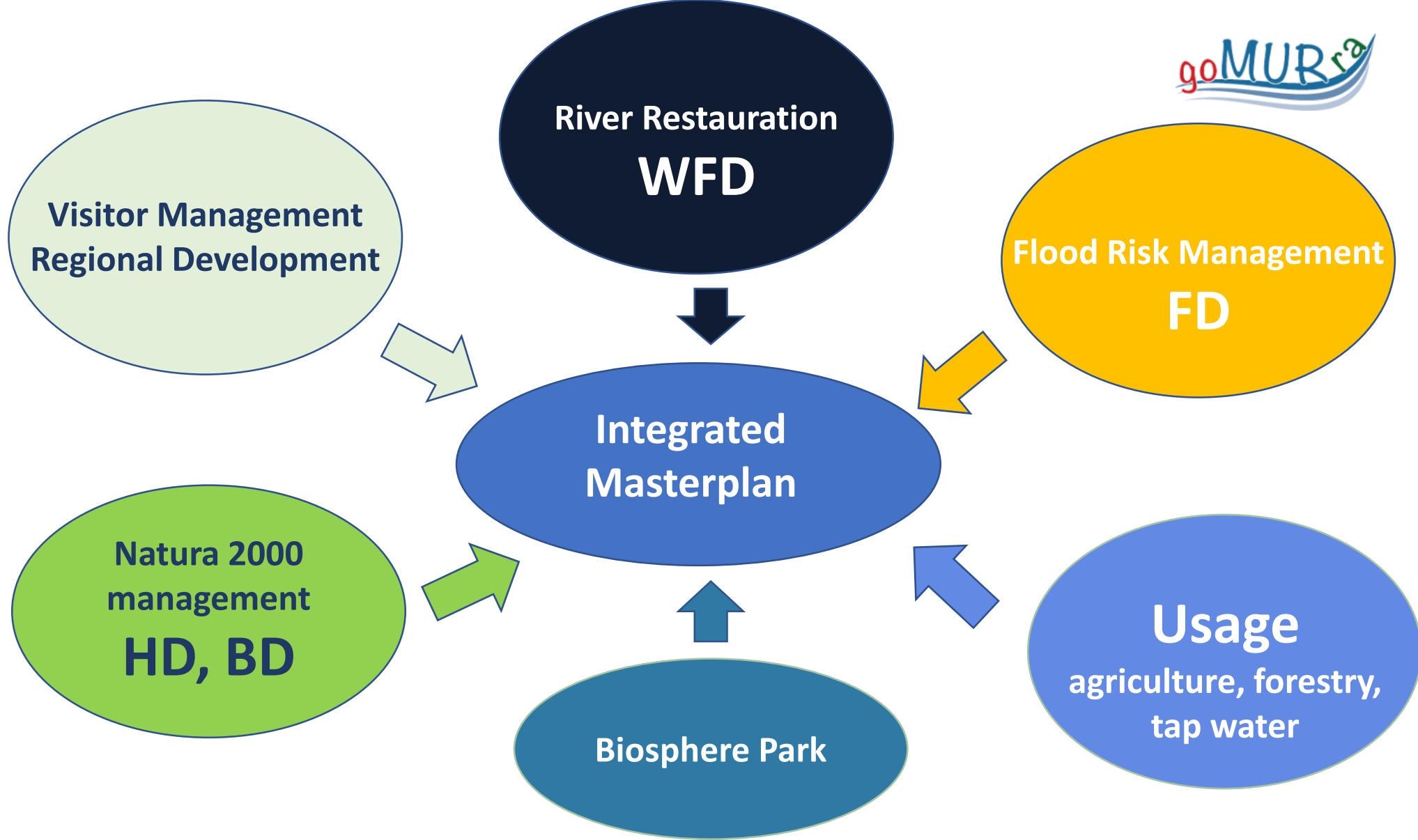


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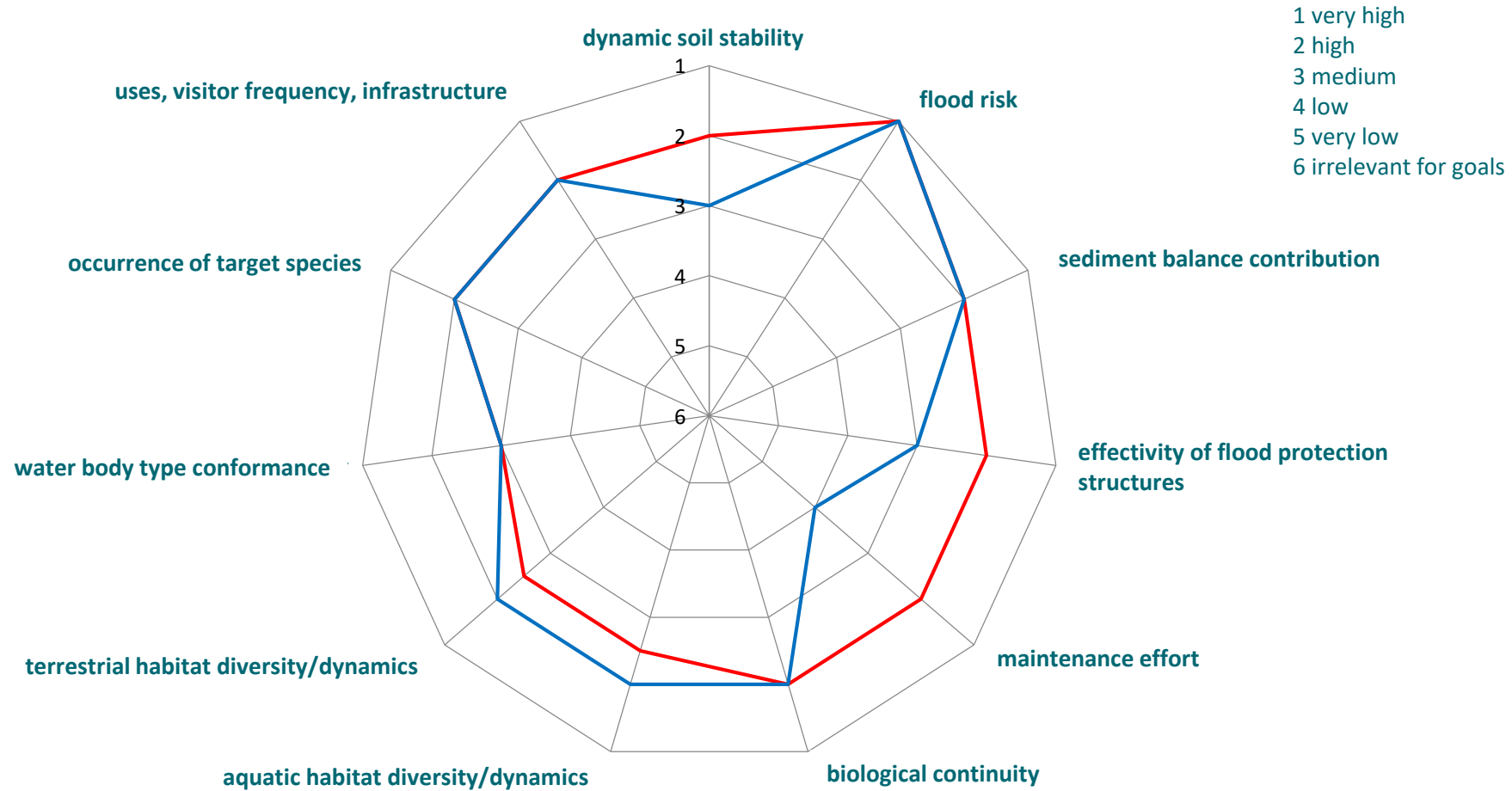
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# Importance of evaluating implemented measures



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Nr.	Measures	Implementation period	km (revitalised)	ha (side waters)	Revitalisation benefits			Conservation profits from			Hydro-engineering protects				
					Animals	Plants	Habitats	Widening	Side arm	Standing waters	Riverbed	Banks	Retention areas	Settled areas	
1	Widening Oberdrauburg Eisenbahnbrücke	A	1.5		X		X	X				X	X	X	X
2	Widening Stana Wiesn	B	0.5		X	X	X	X	X	X		X		X	
3	Widening Stein (both banks)	B	1.3		X		X	X				X	X	X	
4	Widening Dellach, right bank	B	1.2	0.2	X	X	X	X	X	X		X			
5	Berg side waters	B		0.2	X	X	X			X				X	
6	Rebuild of sediment trap, Berg Feistritzbach	C			X	X	X					X			X
7	Greifenburg Amlach – lateral erosion	B	0.4		X		X	X				X		X	
8	Widening Greifenburg Bruggen	A	1.0	0.1	X	X	X	X	X	X		X	X	X	X
9	Widening Greifenburg Radlach	D	0.4		X	X	X	X	X	X		X	X	X	
10	Widening and side arm Kleblach (2007)	B	1.3	0.5	X	X	X	X	X	X		X		X	
11	Widening Kleblach-Lind (1992)	A	0.4		X	X			X	X		X			
12	Pond Reischer Obergottesfeld	B		1.6	X	X	X			X				X	
13	Side waters Obergottesfeld	B		0.3			X	X						X	
14	Widening Obergottesfeld (2011)	C	2.8	3.2	X	X	X	X	X	X		X	X	X	X
15	Widening Sachsenburg (1999)	B	0.9				X	X				X	X		X
16	Widening Rosenheim (2007)	C	1.0	1.2	X	X	X	X	X	X		X		X	
17	Widening Lendorf	D	1.0	0	X	X	X	X		X		X		X	X
18	Retention basin Lendorf	B	0.1	0	X	X	X		X	X				X	
19	Widening Spittal West	B	1.6	0	X	X	X	X		X		X	X	X	X
20	Retention basin Baldramsdorf	B	0	2.0	X	X	X		X	X		X		X	
21	Side waters Spittal Ost	B		0.3	X	X	X	X		X		X	X	X	X
22	Side waters Spittal Mitte	B		0.9			X	X		X		X	X	X	X
23	Widening Spittal Ost	B	0.9				X	X		X		X	X	X	X
24	Widening Amlach/St. Peter (2010)	C	1.0	0.6	X	X	X	X	X	X		X		X	
	<b>Total</b>		<b>17.3</b>												

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# Management plan 2020 – Lead questions:



Which **integrated plan** is best suited for the implementation of the 4 EU directives?

Which specific further **water management measures** should be used to continue progress?

Which specific **conservation measures** can improve the status of the protected goods?

How can the **locals of the Mura** participate in the planning process of this generation-spanning project?

How can a good cooperation of the **relevant sectors** be ensured (water management, conservation, agriculture, forestry and regional development)?

Which sustainable **regional economic developments** can benefit from the integrated management plan?

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# Integrated Masterplan 2030

Simplifies implementation:

Coordination between interests and disciplines is integrated into the planning process!



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# goMURra

Balancing people and nature



## Continuing the chosen path!

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# THANK YOU!

Klaus Michor  
REVITAL

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Das Land  
Steiermark  
→ Wasserwirtschaft

