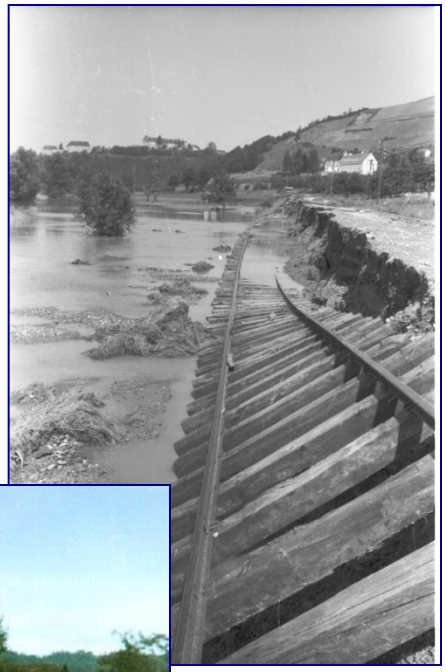
Das Land Steiermark

Strategy
flood protection in Styria

Rudolf Hornich
Coordinator Flood Risk Management
Federal Government of Styria

Das Land Steiermark

Frequent Floods during the second half of the 20th century. Problems for the villages and agricultur in the major valleys



Das Land Steiermark

Flood
August 2002

Strategie Hochwasserschutz Steiermark


Hatzendorf)


© (BBL Hartberg)


© (BH Voitsberg)

Schäden in der Stmk. Juni bis September 2009: ca. € 79,3 Mio.

Das Land Steiermark

Hochwasser Juli 2010

Abbildung 58: Verklausung beim Gasthaus Grabenmühle (Quelle: BGM Gößnitz).

Regen: 120 mm in 1Std. (lokal) – 131mm in 24 Std. (offiziell)

Das Land Steiermark

Hochwasser Juli 2011

Murenabgang St.Lorenzen, Gde. Trieben, 2012

Das Land Steiermark

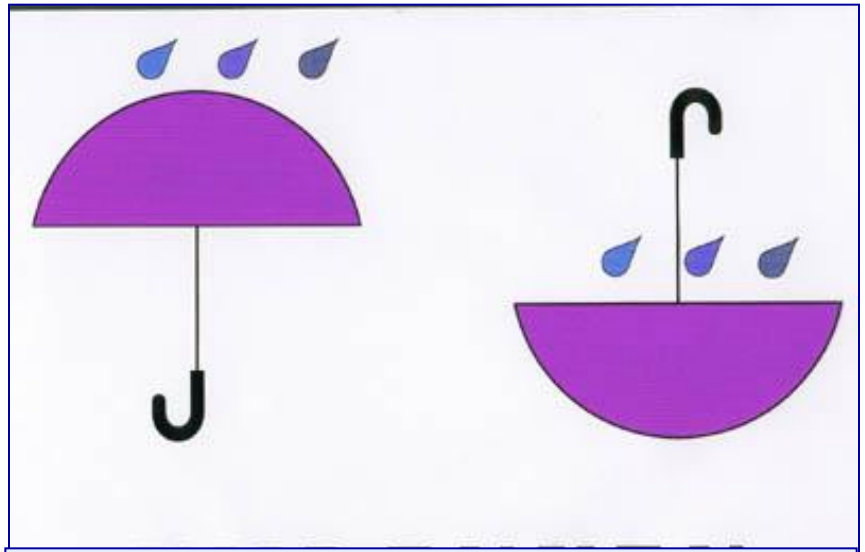
River Regulation (1950 – 1980)

- smooth river banks
- uniform gradient
- no plantings

Das Land Steiermark

In the 1980ies – turning point in flood prevention policies

Since 1994 no state subsidies for flood protection and draining of agricultural land



RETHINKING

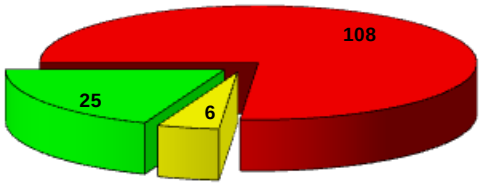
Shifting from a linear to more area-wide-oriented approach

Focus: Preservation of natural floodplains and creation of new ones if procurable or the construction of flood retention basins has been prioritised.

Das Land Steiermark

Flood Retention Basins at present:

139 basins are in use (+ 30 in torrential areas)
15 basins are under construction
43 basins are in their planing phase

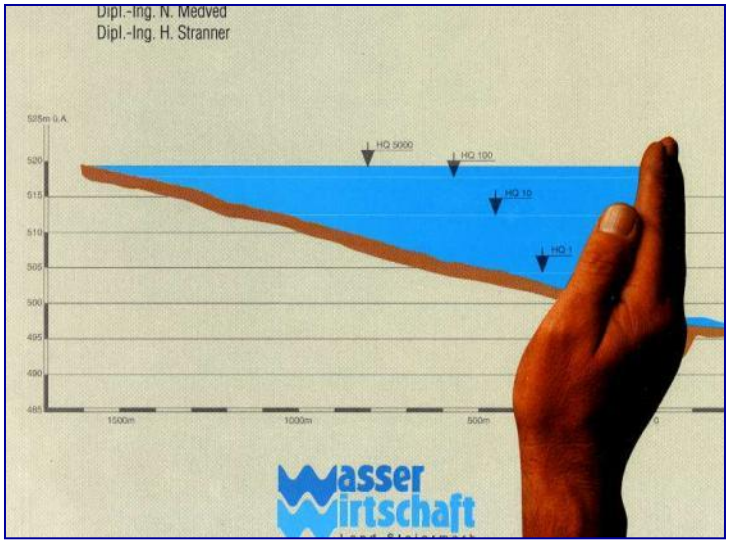


in use | under construction | planing

1990: 24 RB - Retentionvol. rd. 4,4 Mio m³

1999: 70 RB – Retentionvol. rd. 9,0 Mio m³

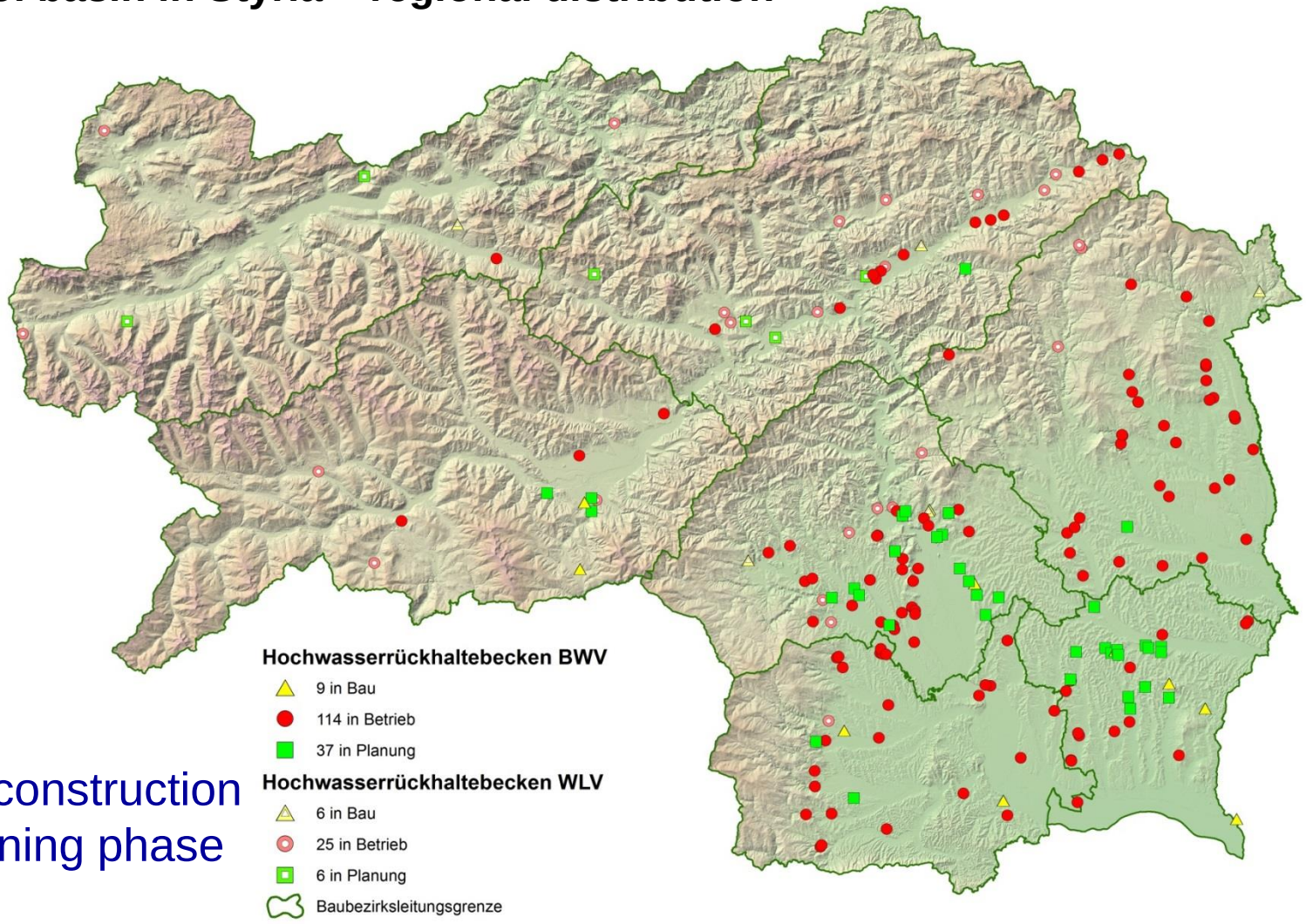
2009: 84 RB – Retentionvol. rd. 15,0 Mio m³



Capacity of the largest basin: 1,7 Mio m³

Das Land Steiermark

Flood control basin in Styria – regional distribution



139 in use
15 under construction
43 in planning phase

Das Land Steiermark

Flood Retention Basins

90% of the basins have a homogeneous erthfill damm as barrage, other basins have a concrete wall.

Das Land Steiermark

Constructivness

ecological issues

short, rough invert to allow for fish to pass

technicalical issues

Emergency spillway is constructed for HQ_{5000}

Regulating/control structure

Controlled retention basins

float gauge

mechanically controlled level gate (float control)


Driftwood rack + bed load retention
14 11 2000

Das Land Steiermark

Flood events summer 2009

28 retention basins were ponded, wheras 15 of them were fully filled

ponded retention basins in the year 2009

Constructivness

Retarding basins are effective in curbing flood waves.

Intervention further downstreams can be reduced.

Das Land Steiermark

Near-natural hydraulic engeneering – soil bioengeneering

Using natural materials

Das Land Steiermark

EU – Water Framework Directive

Sulm Mantrach

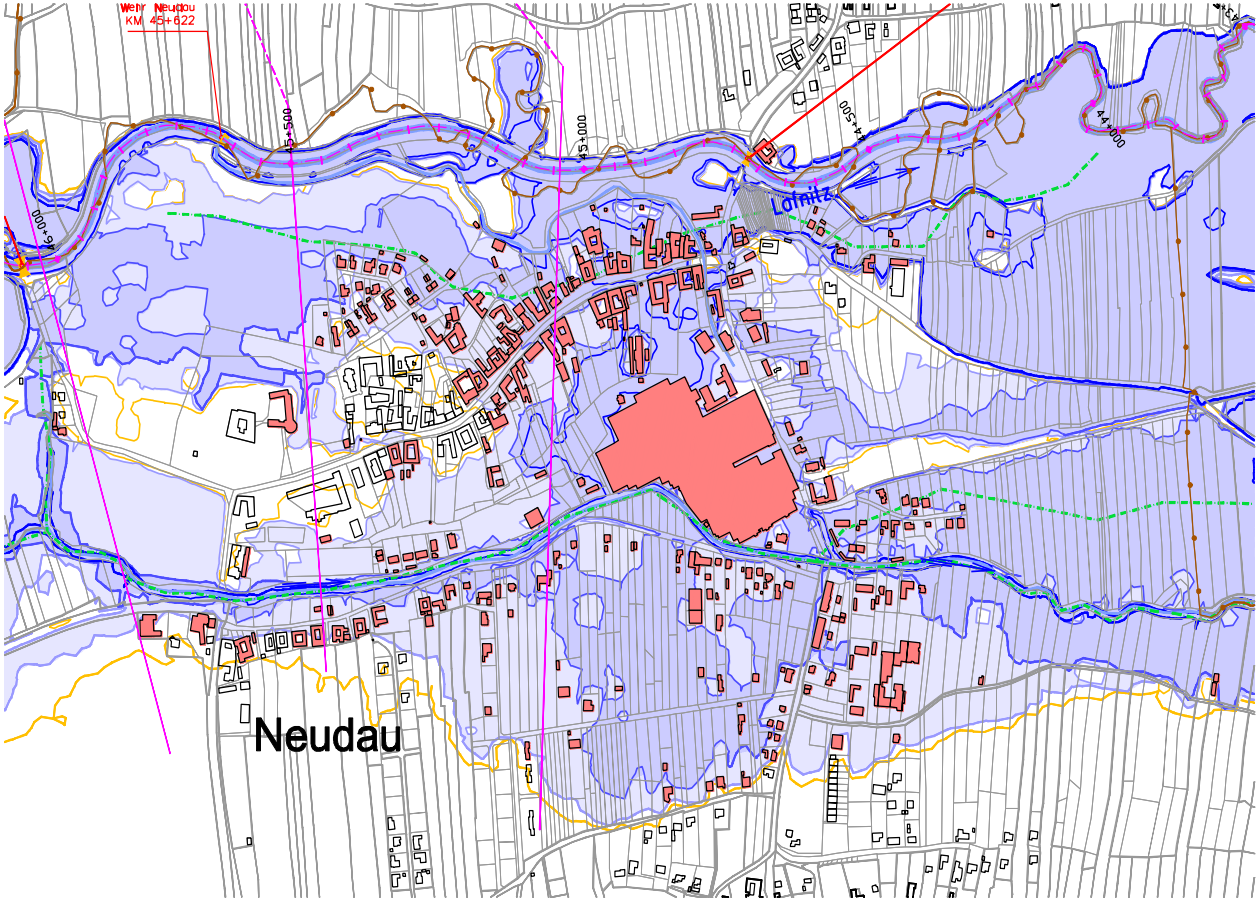
Fish Ladders

Mur Murau

Das Land Steiermark

Mapping Floodplains

Inundation areas HQ30/HQ100/HQ300



LEGENDE:

- Flutungsfläche HQ_{30}
- Flutungsfläche HQ_{100}
- Anschlaglinie HQ_{300}
- Betroffene Gebäude

Partner in several EU - Projects

Interreg IIIA

www.unteresmurtal.steiermark.at

LIFE Natur

www.murerleben.at

River Mur

River Lafnitz

River Enns

Ship mill on the river Mur

Das Land Steiermark

Summary

- **Strategies in flood control changed over the past 50 years**
- **Water retention play a major role**
- **Projects have to comply with the EU-WFD (2000/60/EC) and FD (2007/60/EC)**
- **Higher degree of security for areas of settelment and industrial areas**

Focus on non structural measures - FD (2007/60/EC)

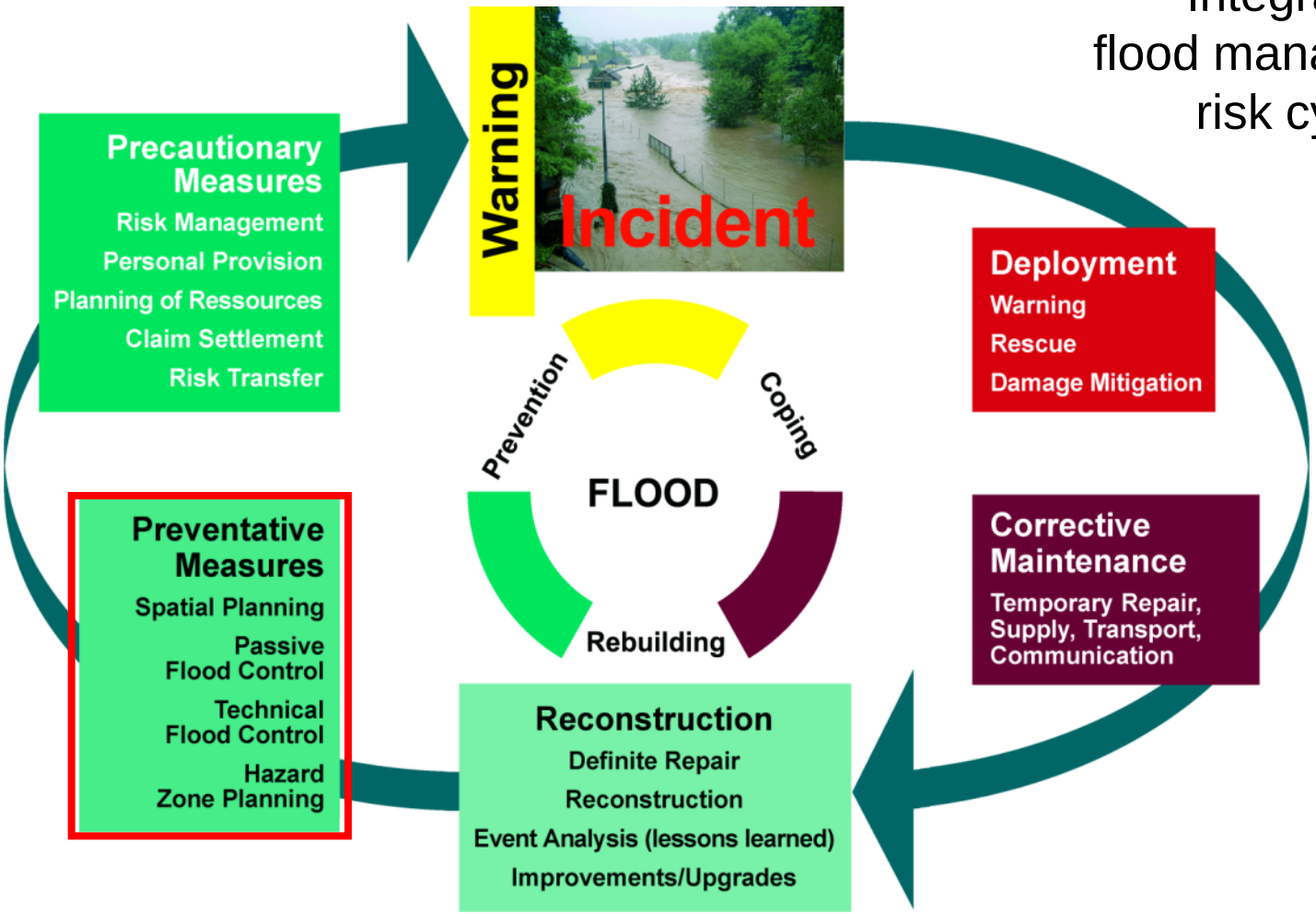
- **close cooperation with spatial planning**
- **improvement of forecast systems and intervention plans**
- **more public information and citizen involvment**

River Basin Managment = Area Managment

Das Land Steiermark

Directive 2007/60/EG

Integrated flood management risk cycle



Habersack et al., 2004

Das Land Steiermark

Das Land Steiermark

Flood events summer 2013

Thank you for your attention!

Retention basin Schöckelbach, Graz, 7th June 2013