

NWRM – 1st Danube Region Workshop, 28/29 Jan 2014, Szentendre/HU

NWRMs – experience from Austria



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Main characteristics of AUSTRIA

alpine

- precipitation, incline, settlements & (land)uses

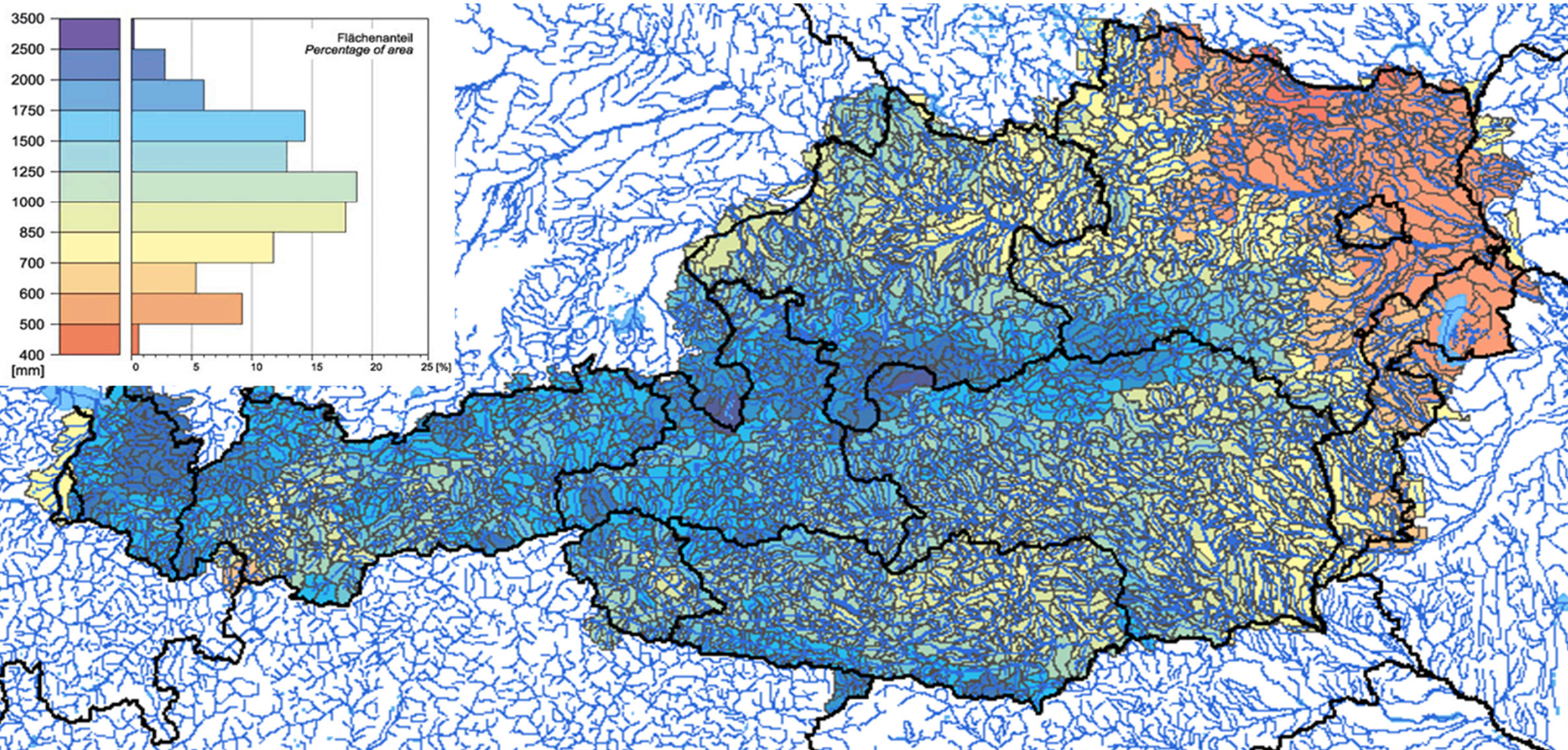
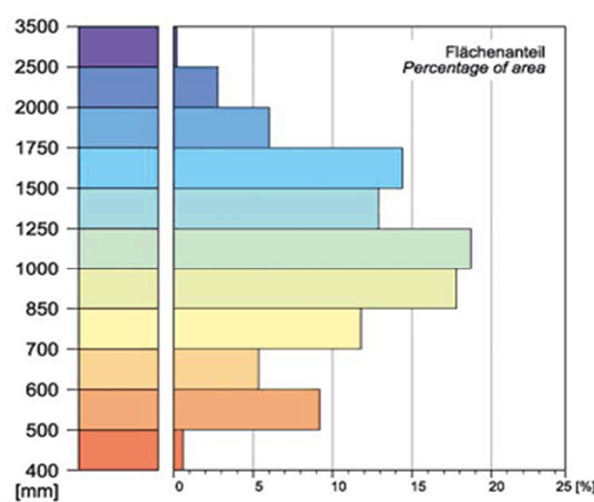
Annual Precipitation in Austria

400 – 3500 mm/a



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Mittlerer jährlicher Gebietsniederschlag 1961 - 1990
Mean annual areal precipitation 1961 - 1990



Areas available for permanent settlement



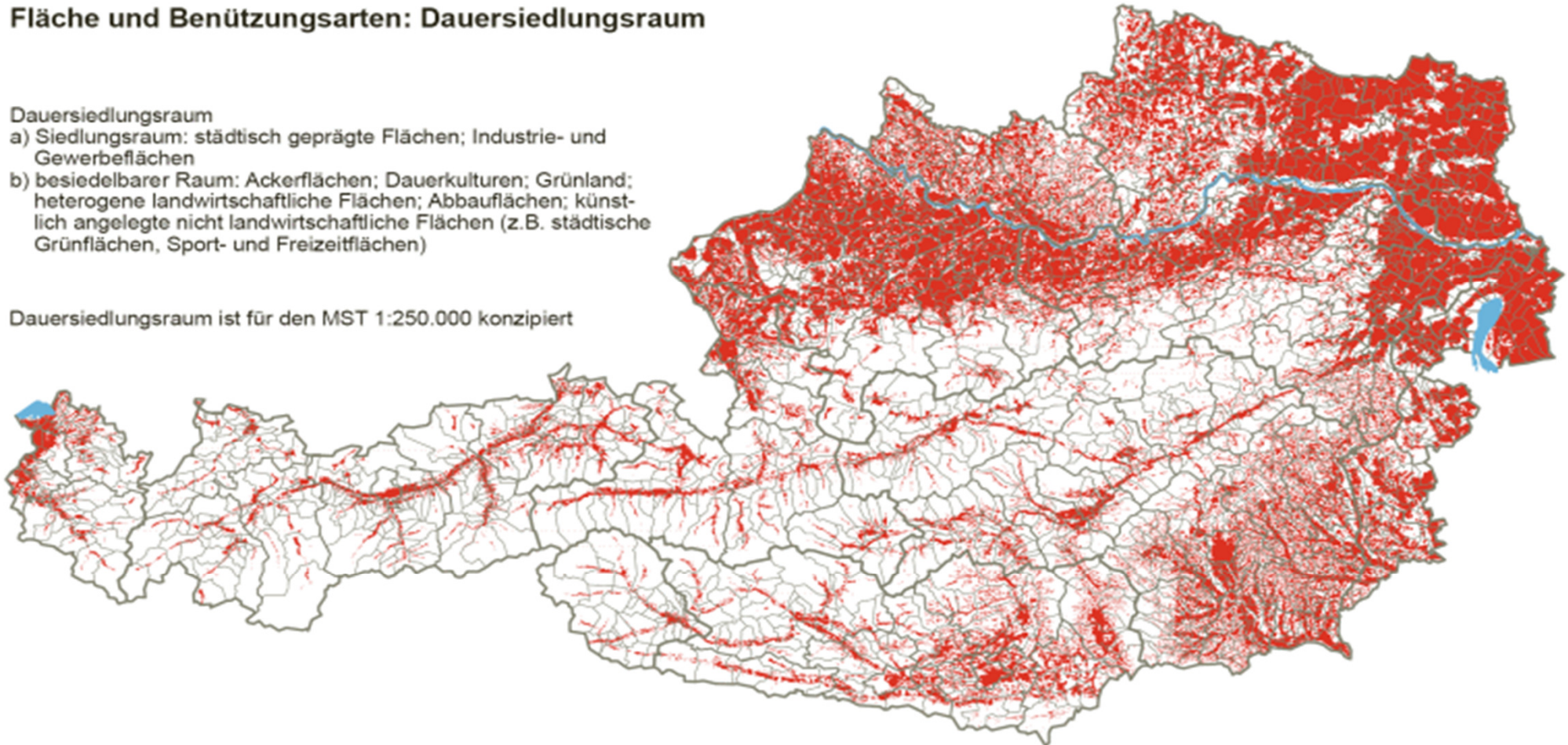
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Fläche und Benützungsarten: Dauersiedlungsraum

Dauersiedlungsraum

- a) Siedlungsraum: städtisch geprägte Flächen; Industrie- und Gewerbeflächen
- b) besiedelbarer Raum: Ackerflächen; Dauerkulturen; Grünland; heterogene landwirtschaftliche Flächen; Abbauf Flächen; künstlich angelegte nicht landwirtschaftliche Flächen (z.B. städtische Grünflächen, Sport- und Freizeitflächen)

Dauersiedlungsraum ist für den MST 1:250.000 konzipiert



Nicht-Dauersiedlungsraum

- Wälder; Kraut/Strauchvegetation; Wasserflächen; Feuchtflächen (z.B. Schilf, Moor); offene Flächen ohne oder mit geringer Vegetation (z.B. Ödland, Gletscher)

0 30 60 km

Dauersiedlungsraumabgrenzung erfolgte auf der Grundlage der CORINE-Landnutzungsdaten 2000 und der Einwohner- und Beschäftigungszahlen 2001.
Erstellt am: 21.04.2008.

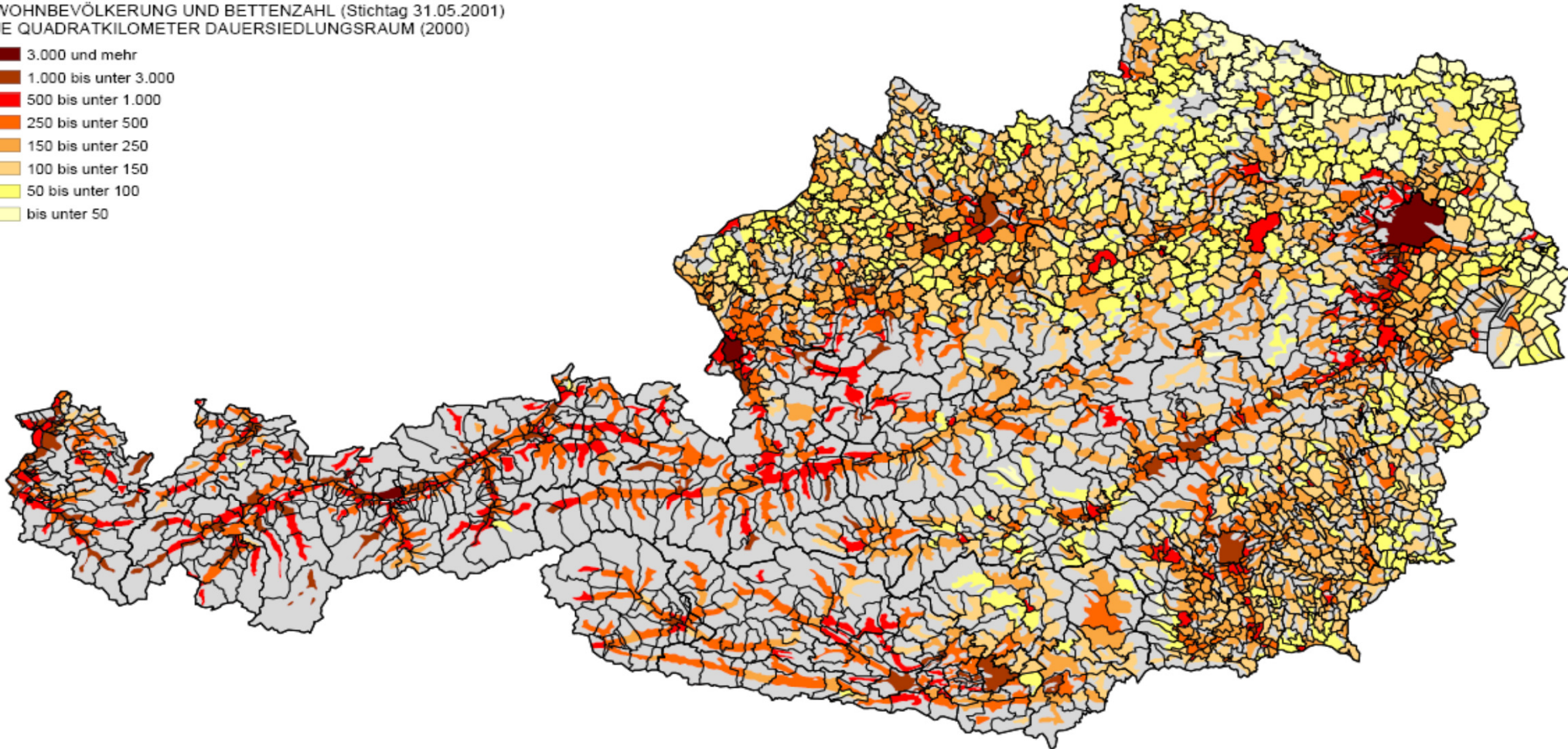
Population densities



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WOHNBEVÖLKERUNG UND BETTENZAHL (Stichtag 31.05.2001)
JE QUADRATKILOMETER DAUERSIEDLUNGSRaum (2000)

- 3.000 und mehr
- 1.000 bis unter 3.000
- 500 bis unter 1.000
- 250 bis unter 500
- 150 bis unter 250
- 100 bis unter 150
- 50 bis unter 100
- bis unter 50



CORINE Landcover: Wälder, naturnahe Flächen, Ackerland, Weinbau, Wiesen und Weiden; Berggebiete

CORINE Landcover Nomenklatur

- 2.1.1 Nicht bewässertes Ackerland
- 2.2.1 Weinbauflächen
- 2.3.1 Wiesen und Weiden
- 2.4.2 Komplexe Parzellenstrukturen
- 2.4.3 Land- und forstwirtschaftliche Flächen
- 3.1.1 Laubwälder
- 3.1.2 Nadelwälder
- 3.1.3 Mischwald
- 3.2.1 Natürliche Grünflächen
- 3.2.2 Heiden und Moorheiden
- 3.2.4 Wald-Strauch-Übergangsstadien
- 3.3.2 Felsflächen ohne Vegetation
- 3.3.3 Flächen mit spärlicher Vegetation
- 3.3.5 Gletscher und Dauerschneegebiete

Seen über 1 km²

- 1, Achensee
- 2, Altaussee See
- 3, Alpe Donau
- 4, Attersee
- 5, Bodensee
- 6, Dobrastausee
- 7, Faaker See
- 8, Fuschlsee
- 9, Gepatsch Stausee
- 10, Grabensee
- 11, Grundlsee
- 12, Hallstätter See
- 13, Heiterwanger See

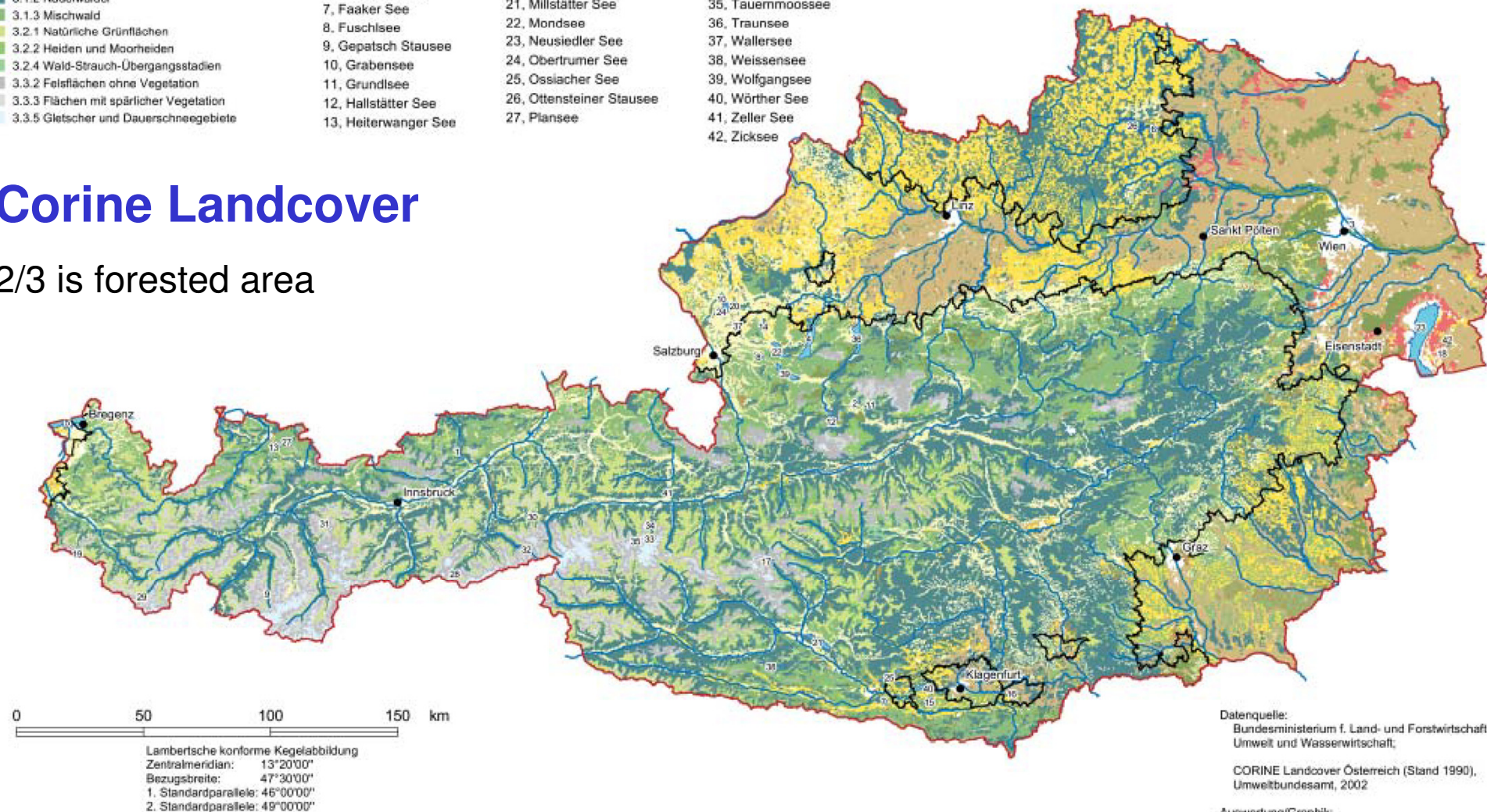
- 14, Irrsee
- 15, Keutschacher See
- 16, Klopeiner See
- 17, Kölnbreinspeicher
- 18, Lange Lacke
- 19, Lünzersee
- 20, Mattsee
- 21, Millstätter See
- 22, Mondsee
- 23, Neusiedler See
- 24, Obertrumer See
- 25, Ossliacher See
- 26, Ottensteiner Stausee
- 27, Plansee

- 28, Schlegeisspeicher
- 29, Silvretta-Stausee
- 30, Speicher Durlaßboden
- 31, Speicher Finstertal
- 32, Speicher Zillgründl
- 33, Stausee Mooserboden
- 34, Stausee Wasserfallboden
- 35, Tauernmoossee
- 36, Traunsee
- 37, Wallersee
- 38, Weissensee
- 39, Wolfgangsee
- 40, Wörther See
- 41, Zeller See
- 42, Zicksee

- Fluss
- Staatsgrenze
- Landeshauptstadt
- Berggebiet

Corine Landcover

2/3 is forested area



Datenquelle:
 Bundesministerium f. Land- und Forstwirtschaft,
 Umwelt und Wasserwirtschaft,

CORINE Landcover Österreich (Stand 1990),
 Umweltbundesamt, 2002

Auswertung/Graphik:
 Umweltbundesamt GmbH, 2002

Main relevant characteristics

alpine (precipitation, incline, 2/3 forest areas)

- Limited areas for settlements –
high population density: in valleys and basins

→ **flood protection has long tradition!**

25% of river net > 10 km² is significantly altered in morphology

Austrian commitment for „sustainable flood protection“



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clear legal linkages:

National Water Act

Any intervention which might have a significant effect on water quality/ecology (hydropower, flood protection, water abstraction, waste water discharges, ...) needs authorisation

- 1990: negative ecological effects have to be minimised, ecological functioning has to be ensured

2003: adaption to WFD objectives/requirements

2011: adaption to FD requirements

„Protection against water and protection of waters“



Technical Guidelines for Flood protection (RIWA-T)

- strategies for sustainable flood management



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General principles

- Avoidance of those measures that would increase erosion and the discharge of draining water.
- Adaptation of the landuse in zones near water bodies to the effects of excessive run-off and high water levels.
- Support of the natural possibilities of water retention and the improvement of the bed load balance.
- Conservation and reactivation of natural run-off and retention areas.
- Having regard to the ecological functions of water bodies, also for measures that are applied in settled areas.
- Preferential use of near-natural methods of building that correspond to the latest developments in technology.
- Taking into consideration the whole river basin or catchment area when choosing measures.



Sustainable flood protection



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Hierarchy of measures

- Passive (non-structural) flood protection (i.e. adaptation of use to the particular hazard) has priority over active flood protection (structural protection measures)
- Measures in the catchment area have priority over measures at the main channel.
- Retention measures have priority over linear structural measures.
- Natural and near-natural methods of building have priority over methods that are less so.



First choice „passive“ measures



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any avoidance of activities which may increase flood intensity

- adapting uses to events of high floods (restricted uses)
- acquisition of lots of land by the government to keep free from use
- acquisition of lots in outlying areas to be exchanged later on
- transposition of land use to areas with low flood risk
- use and maintenance of existing retention areas

Prevention - reduction of floodpeaks:

Danger of flooding can be reduced most effectively through natural retention in riparian forests and meadow lands, floodplains and undeveloped areas in valleys.

*Availability of retention area in Austria ~ 110 Mio. m³
in 2012: creation of more than 3 Mio. m³*



Technical Guidelines for flood protection (RIWA-T)

...directly linked to national funding scheme –
requirements for being financed

sets different level of flood protection planning

- River development schemes (supraregional, flood risk, WFD objective, uses, social aspects,)
- Regional planning
- General project planning
- Detailed project planning

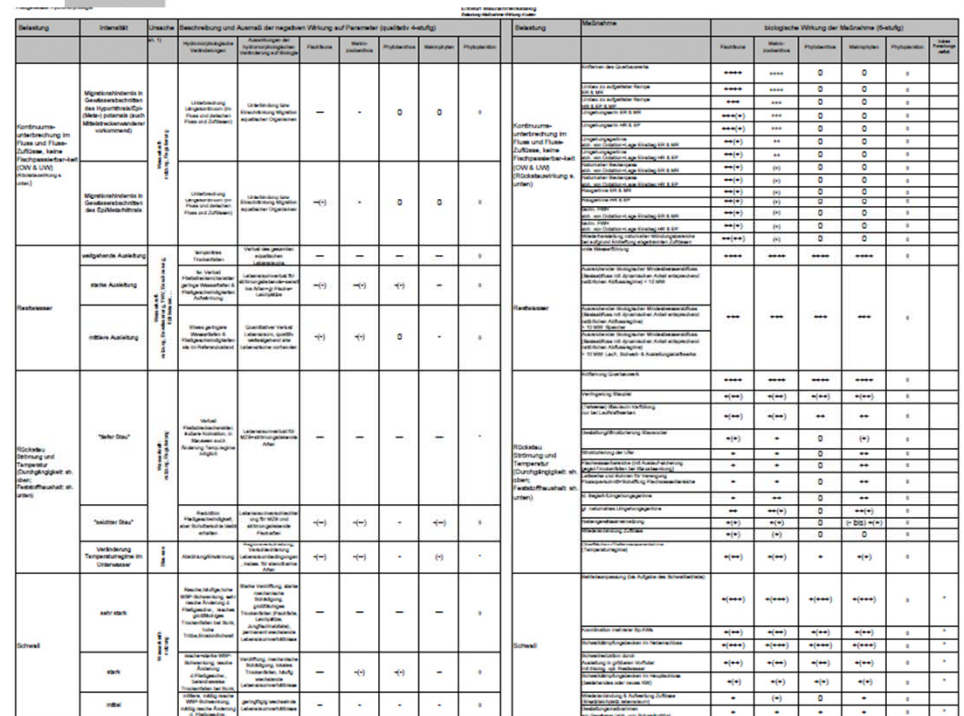
states scope, required data/info (hydraulic, hydrological, (hydro-)geological, sediment, soil mechanics, ecological, ...), data quality, maps, (...), requirements for cost calculation, recommendations for public involvement, ...
includes forms, checking lists,

TECHNISCHE RICHTLINIEN für die Bundeswasserbauverwaltung

RWA-T gemäß § 3 Abs. 2 WBFG
FASSUNG 2006



- effects on biology
- effects on hymo
- effects on water quality
- cumulative effects/interactions
- effects on other uses
- reaction time for ecol improvement
- costs

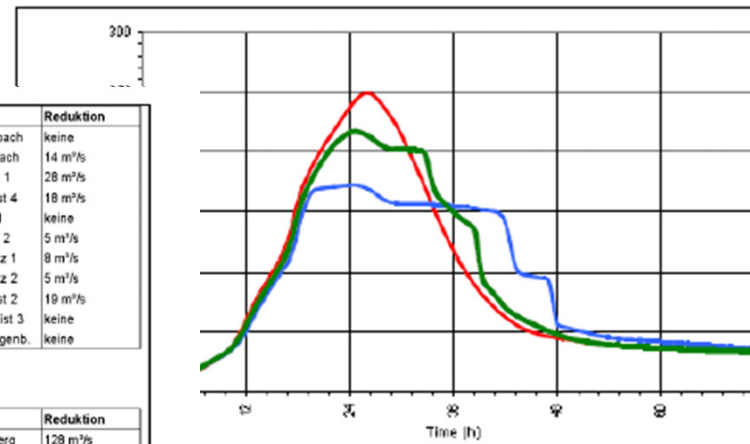
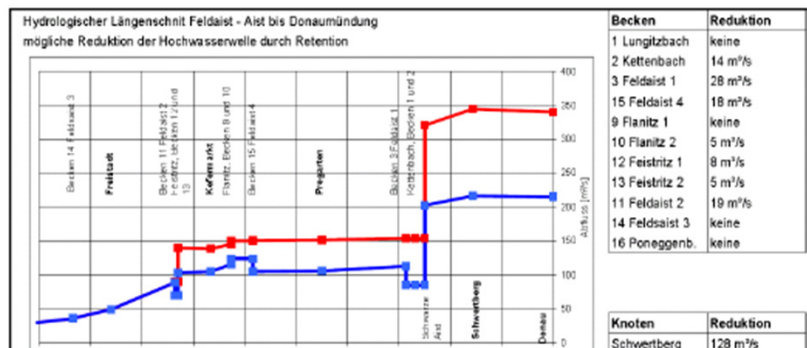


Costs

Are to be taken into account:

several options are evaluated;
not the „cheapest“ will be implemented
automatically as also ecological
objectives have to be met.

Natural retention is usually
much more expensive than
technical measures



GUTACHTEN Analyse von geplanten Hochwasserschutzmaßnahmen an der Aist in Oberösterreich



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Hainersdorf, Dezember 2012

Abbildung 14: Matrix zur Lösungsfindung (sind nur Beispiele, müsste vor Umsetzung noch im Detail geprüft werden)

Kriterien:	Wirksamkeit					Kosten					Ökologie					soziale Verträglichkeit					Summe
	HQ ₁₀	HQ ₃₀	HQ ₅₀	HQ ₁₀₀	>HQ ₁₀₀	sehr hoch	hoch	mittel	niedrig	sehr gering	Rote-Liste-Arten bedroht	Fischwanderungen werden ständig unterbunden	Fischaufstieg funktioniert, Geschiebe wird zurückgehalten	Fischaufstieg funktioniert, Geschiebe wird periodisch weitertransportiert	Durchgängigkeit für Wasser, Biota und Feststoffe ständig gegeben	HW-Schutzmaßnahme wird gegen den Widerstand der Anrainer durchgeführt (z.B. Zwangsenteignung)	HW-Schutzmaßnahme berührt massiv Anrainerinteressen	?	HW-Schutzmaßnahme durch Zustimmung der Anrainer	HW-Schutzmaßnahme berührt keine Anrainerinteressen	
Zielerfüllung:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	

Lessons learnt



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Use of existing natural retention areas is the most cost-effective measure

Improving hydromorphology of altered rivers (incl. floodplain reconnection) - „giving more room“ – is a win-win-solution

- indispensable for the achievement of WFD objectives
- a valuable measure for FD
- increases biodiversity
- increases natural retention
-

Retention areas are in most cases much more expensive than straight technical measures for flood protection

Political commitment for sustainable management / use of NWRM is crucial

Need of a definite financing instrument;
financing /financial support has to be linked to ecological objectives



„Critical“ lessons learnt



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Hydropower reservoirs can have a positive retention effect, but in special cases can even increase flood peak

Flood plains are never the most cost effective measure with regard to nutrient/ contaminants removal/ improving water quality as they can never can replace the efficiency of a waste water treatment plants (UWWD has to be fulfilled anyway!)
Is a valuable supportive measure

In general:

NWRM are not automatically more ecologically sound; they can also can have a negative effect on ecological status (deterioration!)
i.e. modification of a river to retention pond, building meanders where this is not typespecific,



Lessons learnt



In most cases we can ensure that

- new flood protection measures can be performed in a way that good ecological status is still maintained (no deterioration!)
- in HMWBs designated due to flood protection good ecological status can be achieved for all biological elements except fish;
good ecological potential comprises self sustaining fish populations

To be unable to achieve good ecological status (solution: HMWB, exemption) is often a lame excuse for not being willing to do anything.

Costs might often be a limiting factor – but ...

Is the ecological damage also calculated correctly?

Are the solutions sustainable or just producing new problems elsewhere?





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Foto: Salzach Burghausen (Christian Weinberger)

**Thank you ...
for your attention**

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LIFE NATUR WACHAU



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Restrukturierung Ybbsmündung



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Danube, south of Vienna



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Upper Drava



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