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contents

“Best Practices River Restoration Design and Construction, a Dutch consultants view”

- river restoration in NL
- from vision to ground work
- difficulties on the road
- examples
### Rivers to be restored in NL

2 major types of rivers:

- Large rivers: Rhine, Meuse and branches
  managed by State (Rijkswaterstaat)

- Lowland streams/ brooks
  managed by regional water boards

### Large rivers: River Rhine/Waal

- Shipping
- Cooling/ Power Production
- Drinking water supply
- Fresh water supply

Flood risk reduction
- ‘Room for the River’ program
  - 30 projects
  - some spare room for nature
Room for the River: typical measures

- Moving dike backwards
- Reducing resistance
- Lowering river bed
- Lowering flood plain

New side channels in flood plains
Restoration of large rivers

- Major driver is flood risk reduction
- 1 client: Min. Infrastructure and Environment
- Due to budget cuts, back to basics -> less attention for nature development:
- River Meuse: only feasible due to financing by gravel producers

lowland streams: south/east of NL

Blue = below SL
Green = above SL
lowland streams in NL
- 95% regulated since ‘50-60’s for agriculture purposes
- standard profile
- high peaks, low flows
- massive vegetation growth, maintenance
- many weirs, vis migration barriers
- restoration projects since early 90’s
**From vision to ground work (optimal)**

1. **vision** → **prelim. design** → **final design** → **detailed drawings** → **construction**
2. **consultant** → **contractor**
3. **supervision**
4. **client**

**From vision to ground work (also common)**

1. **vision** → **prelim. design** → **final design** → **detailed drawings** → **construction**
2. **consultant A** → **B** → **C** → **contractor**
3. **supervision**
4. **client**
From vision to ground work (future D&C, systems engineering?)

Challenge: making the contractor understand the vision

- ecologists’ vision fades away into technical and concrete solutions during the process
- contractors should have experience in nature construction: selective tendering
- continuous need of dialogue with contractor
- preferably 1 consultant for the process
Example: standard fish passage: series of concrete chambers

Less technical alternative: temporary fish passage
Examples: inundation bypass

100 l/s

10 l/s
Difficulties on the road

- stakeholder commitment: as early as possible
- land acquisition: voluntary basis
- delay by archeology, explosives, contaminated soils, cultural inheritance
- causes delay in financing, risk of loss of subsidy

Stakeholder involvement: showing the case

Royal Haskoning
Voorst te Stroom te Oisterwijk
Safety conditions in urban area determine lay out

River Nemer   use of alien materials for construction
Finally: also found in the Netherlands

Thanks for your attention