River restoration: a strategic approach

Dave Tickner
World Water Congress XV
March 2015
Case studies & literature review

The changing nature of river restoration
Benjamin Smith,1 Nicholas J. Clifford1 and Jenny Mant2

Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals
Margaret A. Palmer,1,2 Kelly L. Hondula,2 and Benjamin J. Koch1,3
1Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, Solomons, Maryland 20688; email: mwpalm@umd.edu;
2National Socio-Environmental Synthesis Center, University of Maryland, Annapolis, Maryland 21401; email: Kelly.Hondula@umd.edu;
3University of Maryland Biological Sciences, North Energizer, 6100 Nathan专辑路, College Park, Maryland 20740; email: Ben.Koch@umd.edu.

Restoring Rivers One Reach at a Time: Results from a Survey of U.S. River Restoration Practitioners
Emily S. Bernhardt,1,2,3 Elizabeth B. Sudduth,1,4 Margaret A. Palmer,3,5 J. David Allan,6 Judy L. Meyer,4 Gretchen Alexander,5 Jennifer Follastad-Shah,1,7 Brooke Hallett,1,3 Robin Jenkinson,8 Rebecca Lave,9 Jeanne Rumps,1 and Laura Pagano9
ABC Waters Programme, Singapore
Lower Danube Green Corridor
Triggers for river restoration

• Impact & emergency
• Expectations & values
• Incremental progress
• Local imperative
Emerging challenges

- Feasibility
- Balance
- Scale
- Uncertainty
- Sustainability
- Science
River health: Aquatic and riparian biodiversity

River health: Habitat
- Channel
- Floodplain
- Wetlands
- Delta

River health: Flow regime

River health: Water quality & sediment chemistry

River restoration measures

- Urban and rural planning regulations
- Introduction of fish passages/removal of barriers
- Limits on development in floodplain/wetlands
- Bank stabilisation
- Modification of river channel
- Bans or regulation of mining/dredging
- Removal of invasive species

Catchment & river processes

- Catchment restoration
- Planting of riparian vegetation
- Introduction of environmental flows/limitations on water abstractions
- Changes to dam/hydropower operation
- Limits on waste discharge
- Improved agricultural practices
- Reintroduction of native species
- Regulation of harvesting of species
Monitoring framework

Drivers & Pressures
- Catchment & River Processes
- River Health
- River Services
- Priorities & Strategy
  - Assess options & develop plan
  - Implementation of actions

Surveillance monitoring
Baseline monitoring
Impact monitoring
Financial monitoring
Activity monitoring
Golden rules for river restoration

1. Identify, understand & work with natural functions & processes
2. Link to socio-economic objectives, broader planning & development activities
3. Identify limiting factors to river health & restore ecological and function, working at the appropriate scale
4. Restore for resilience to future conditions
5. Develop clear, achievable & measurable goals at the appropriate time & spatial scales
6. Ensure a sustainable financing method, including for maintenance
7. Collaborative action is critical
8. Monitor, report, learn & adapt
Thank you

dtickner@wwf.org.uk
@david_tickner