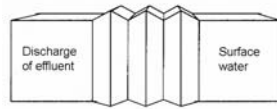


# Biological filtration of treated wastewater by Daphnia: An alternative for technical filtration, or an addition?

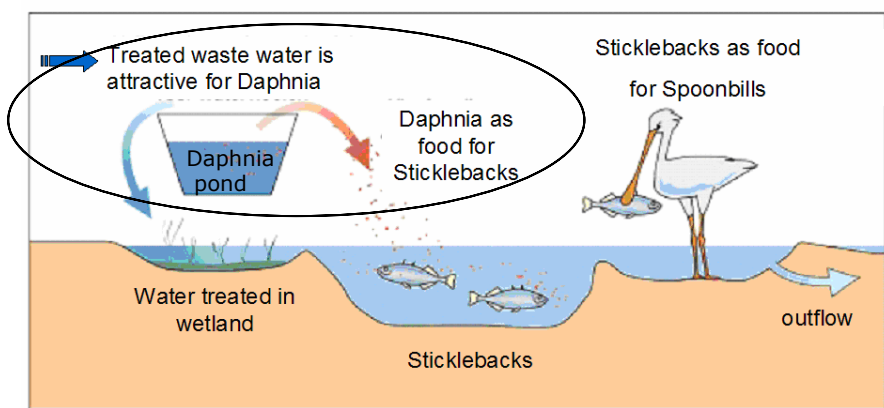
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## Constructed wetlands convert treated wastewater into usable surface water with abundance of "natural life"



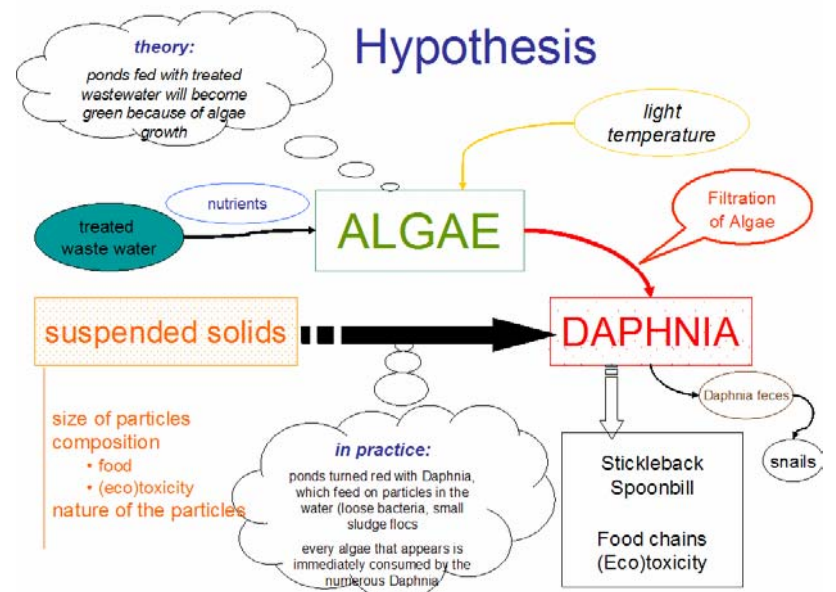
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→ Right

Hypothesis PhD biological filtration of treated waste water

Theory: "green ponds"

Reality: Particles in treated waste water are good feed for Daphnia. These Daphnia not only filter these loose bacteria and sludge particles but also remove algae effectively



### The "Grickleback" process:

- a combined system to reuse treated wastewater for nature enhancement
- Daphnia keep the Daphnia pond clear and remove faecal coli bacteria effectively
- no fish in the Daphnia ponds: optimum for growth of Daphnia
- the constructed wetland transfers the waste water in "fish water"
- it is about Growing Sticklebacks or other fish in a food chain approach
- finally a "natural" pond. Suitable feeding area for birds, spawning area for fish

### Three Mesocosms: Horstermeer, Grou and Empuriabrava



#### STP Horstermeer, The Netherlands

Rather high loaded activated sludge process  
 Ongoing research project Technical filtration

Feed also filtered waste water

Food web studies, harvesting of Daphnia



#### STP Grou, The Netherlands

Very low loaded activated sludge (oxidation ditch)  
 Full-scale Daphnia ponds

"Understanding the full scale process"

Disinfection



#### STP Empuriabrava, Costa Brava, Spain

Very low loaded activated sludge (oxidation ditch)  
 Full-scale Daphnia ponds

"Understanding the full scale process"

Food web studies, harvesting of Daphnia

This research project is part of PhD study of Ruud Kampf: experiments 2007 - 2008

