Harvesting aquatic plants: an environmental management perspective

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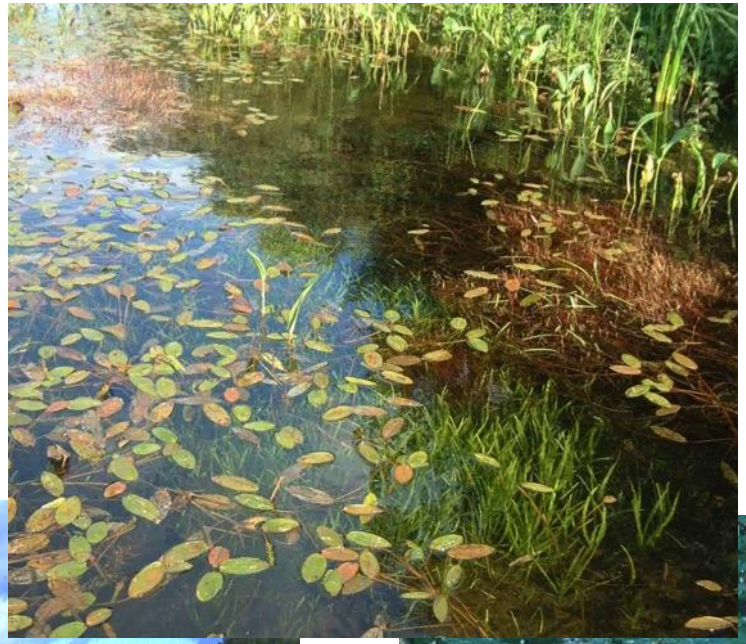
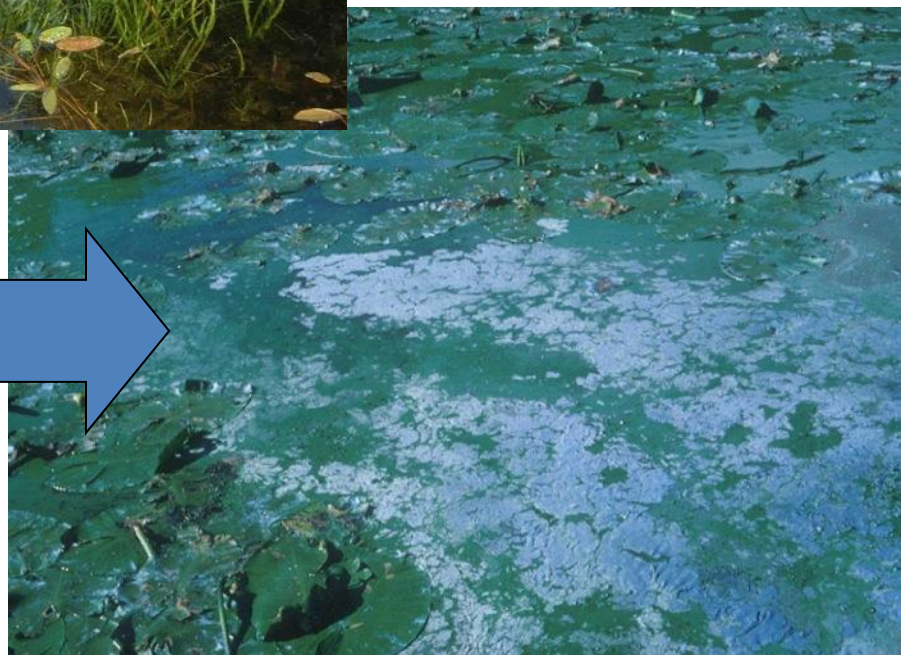
Why harvest aquatic plants?

- Social/aesthetic
- Navigation
- Fisheries
- Land drainage – improved conveyance
- Food – directly or indirectly
- Raw material – construction, roofing, weaving
- Compost/soil additive
- Biomass - energy
- Lake restoration
- Conservation management
- Invasive species management
- Waste water treatment

Social/ aesthetic

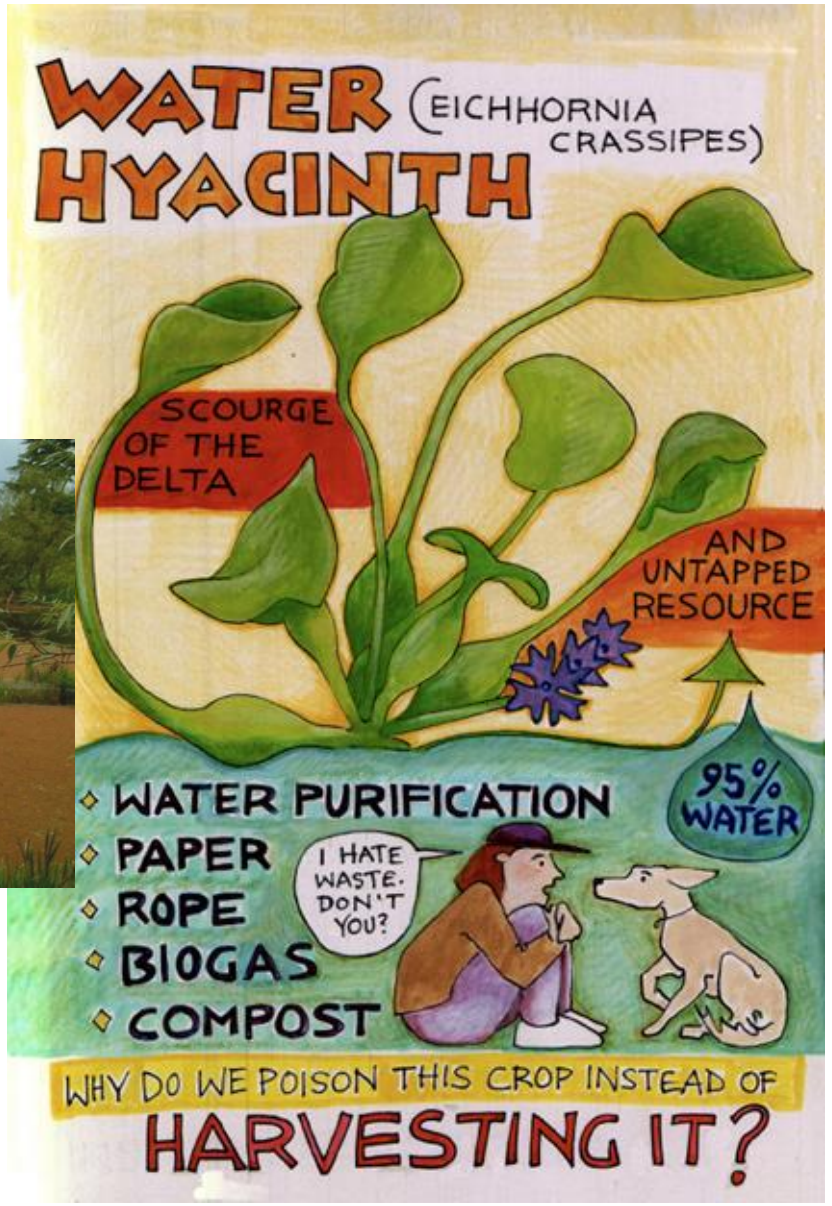




Navigation

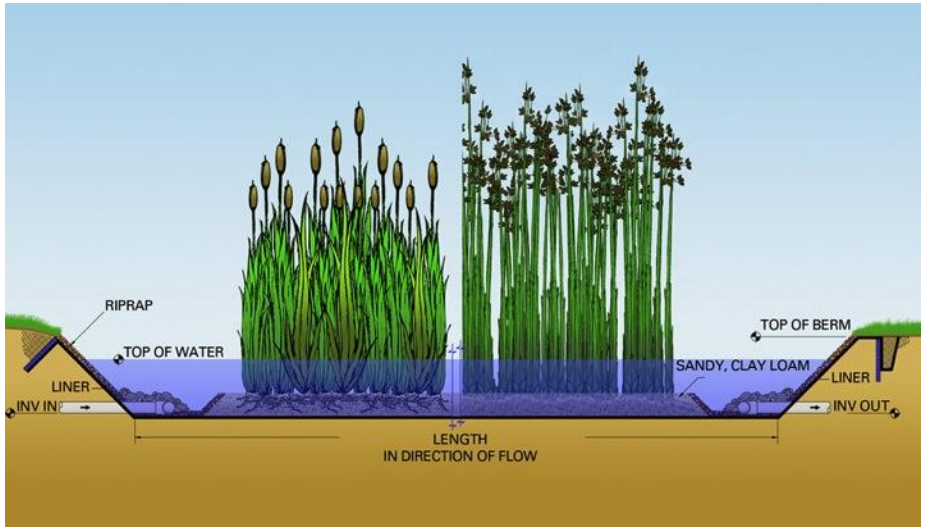
Land drainage/fisheries

Invasive species management



Food and other resources

Waste water treatment



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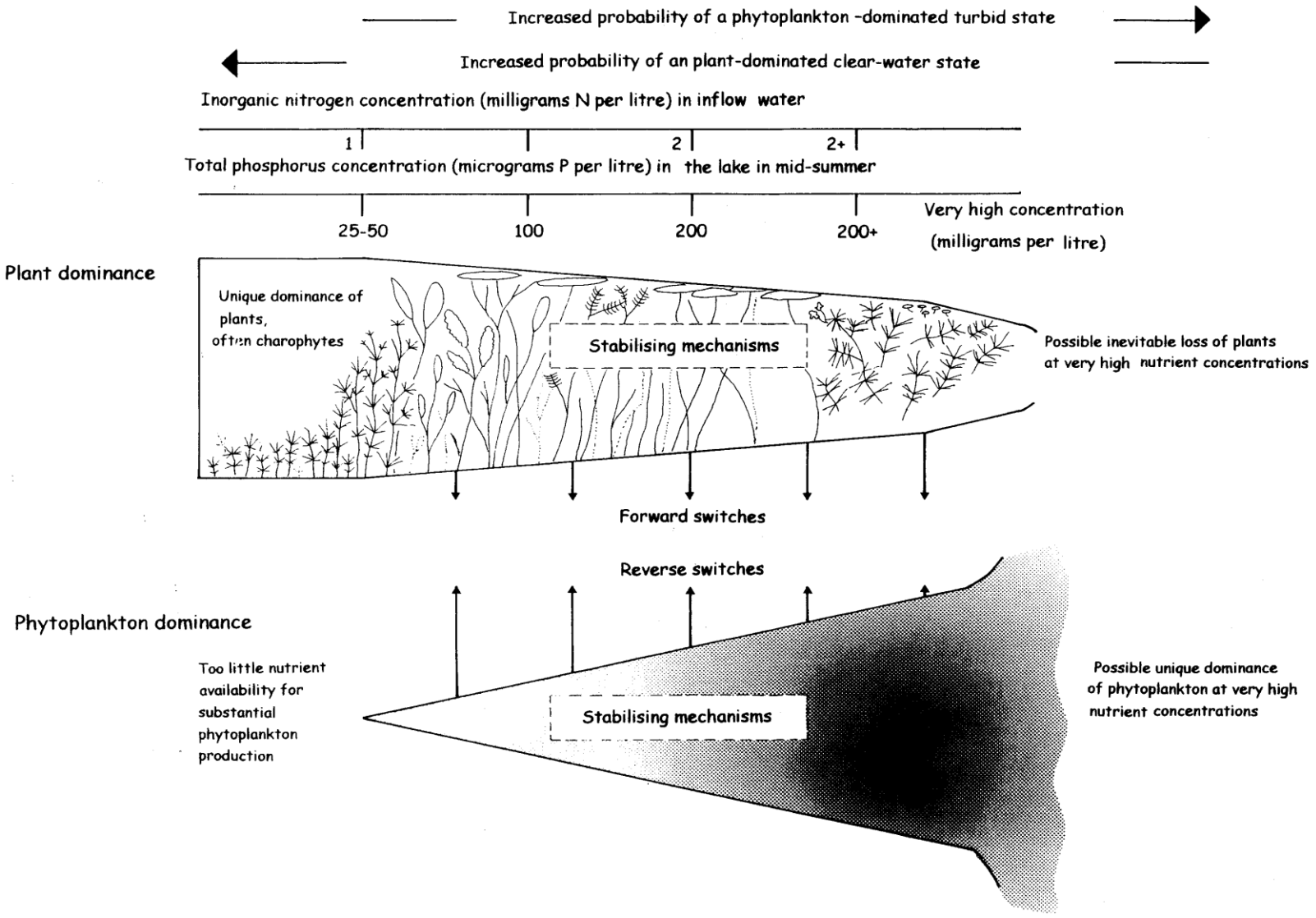
Drivers?

There lots of pressures on aquatic ecosystems…..BUT……

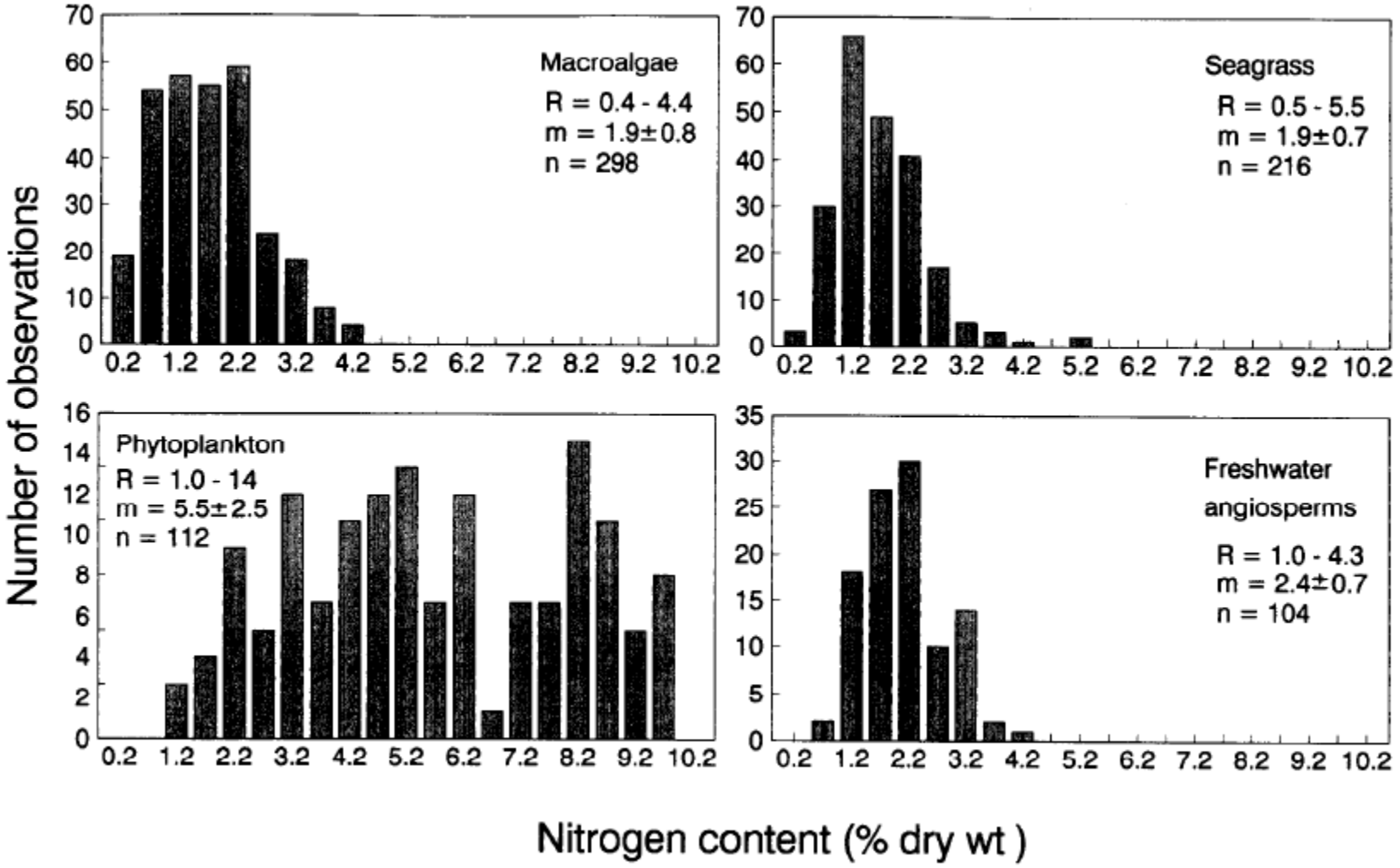
"*Cultural eutrophication has become the primary water quality issue for most of the freshwater and coastal marine ecosystems in the world.*"

Smith V.H. and Schindler, D.W. 2009. Eutrophication science: where do we go from here? *Trends in Ecology and Evolution*, 24(4), pp. 201-207.

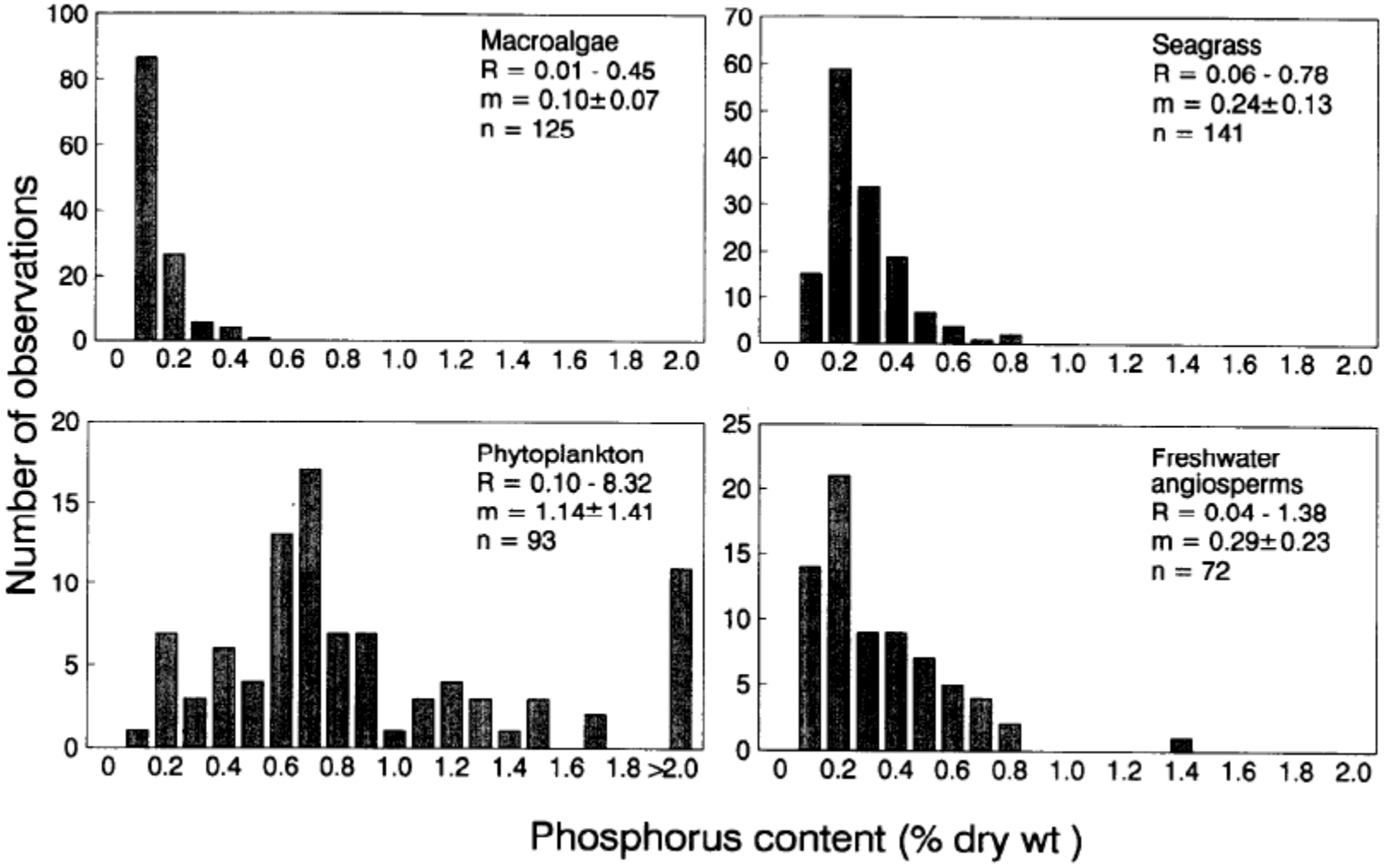
Regime shifts in lakes



Nitrogen content of aquatic vegetation



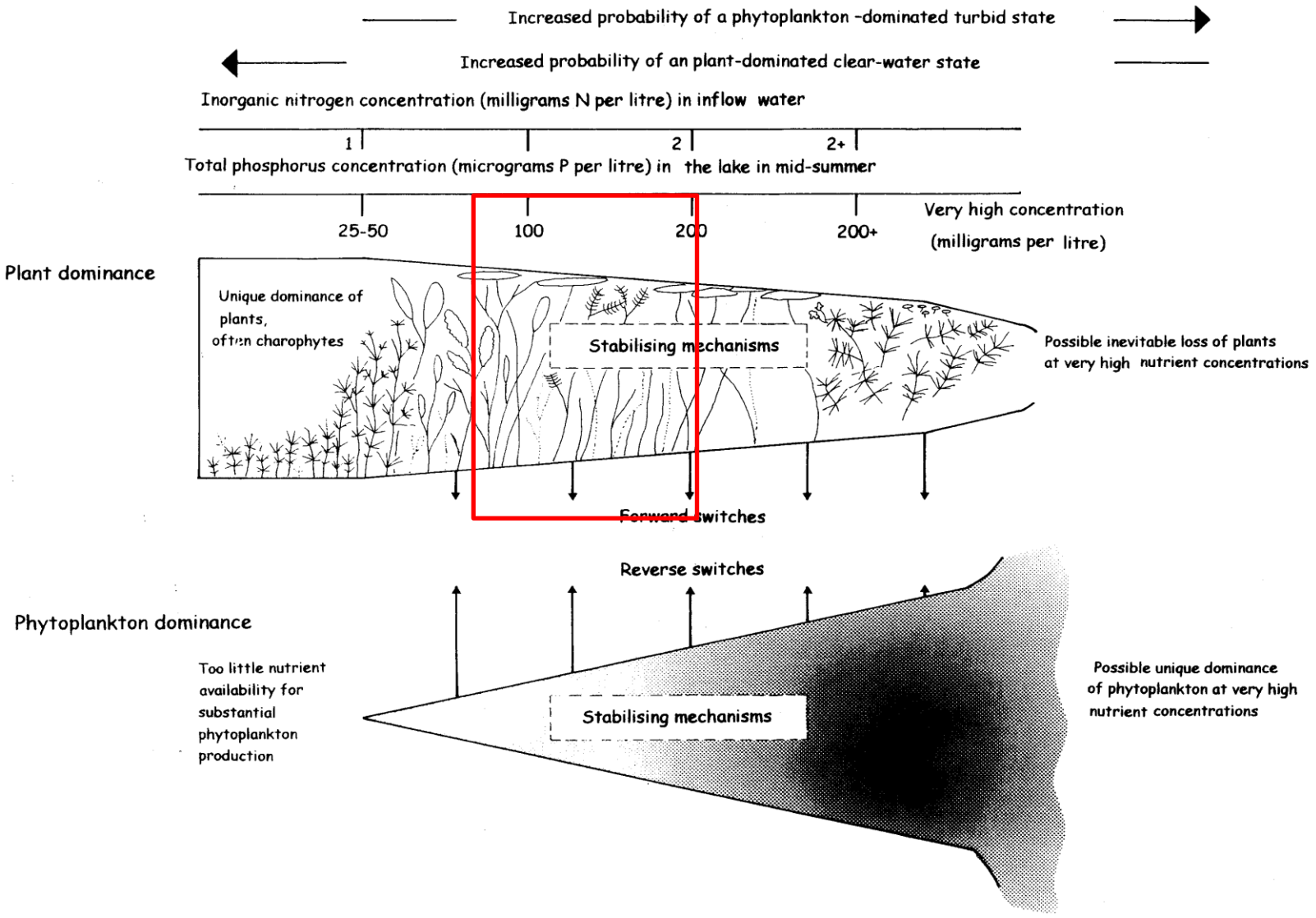
P content of aquatic vegetation



Harvesting macrophytes = removing nutrients?

- Aquatic plants are 90-95% water
- For submerged plants biomass typically 50-500 $gDWm^{-2}$
- For emergent plants typically 500-2000 $gDWm^{-2}$
- Harvesting typically removes 2.5kg N and 0.3kg P per tonne wet weight harvested
- Likely crop from 50-100m^{-2} though most harvesting incomplete – say 100-200m^{-2}
- 1km of canal 10m wide or 1ha pond ~ 130-250 kg N and 15-30kg P
- BUT: Likely to be ineffective if external load is high

Regime shifts in lakes



Other restoration strategies