

# **Restoration of riparian vegetation in the Hunhe River basin, Liaoning, China**

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# Acknowledgements

Analysis of Nitrogen and Phosphorus Content

Characteristic in Woody Plant and Vegetation Restoration

Research in Riparian Zone of Hun River

By

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# Outline

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1. Introduction
2. Situation & Problems
3. Solutions
4. Application

# Introduction

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# Deforestation in Amazon

# What is conservation biology?

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Conservation biology is the study of attempts to protect and preserve **biodiversity\***.

\*<https://www.nature.com/subjects/conservation>

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## It focuses on

- both the biological and social factors that affect the success of conservation efforts,
- determining ecosystems and species whose conservation is a high priority.

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# What is conservation biology?

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## It focuses on

- both the biological and social factors that affect the success of conservation efforts,
- determining ecosystems and species whose conservation is a high priority.

## It has two central goals

- to evaluate human impacts on biodiversity,
- to develop practical approaches to prevent the extinction of species [2] (Soulé 1986, Wilson 1992).

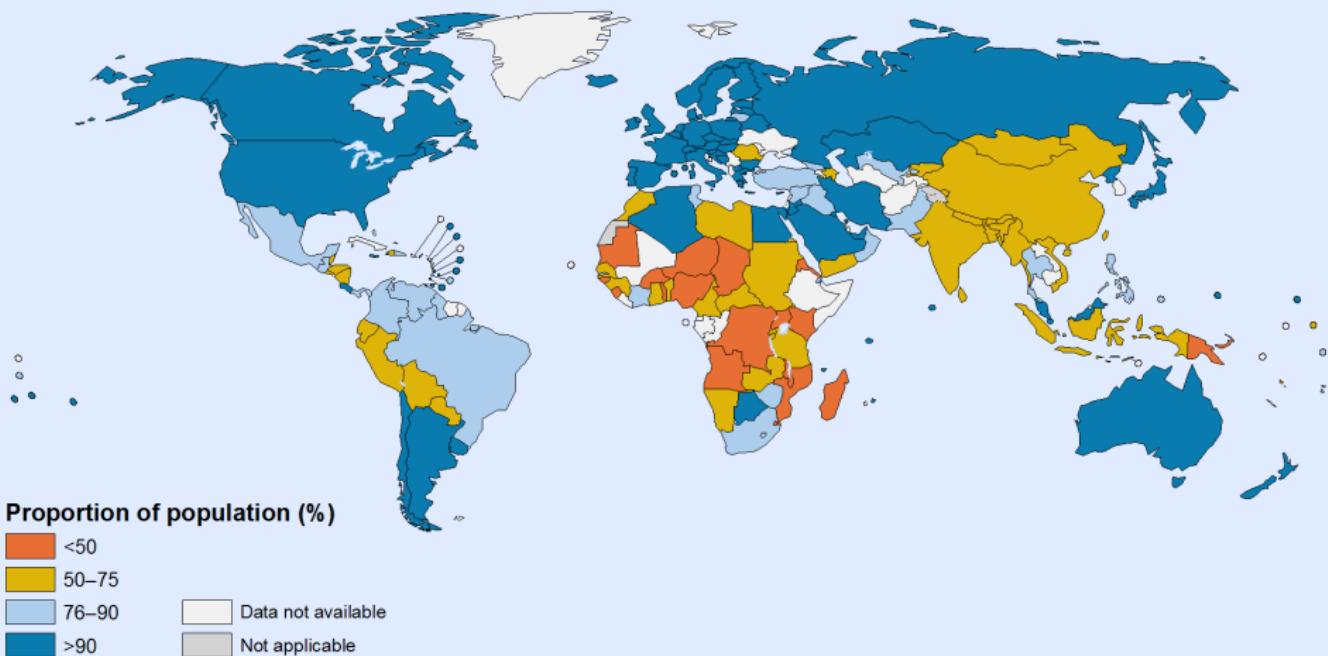
\*<https://www.nature.com/subjects/conservation>

# Why to preserve biodiversity?

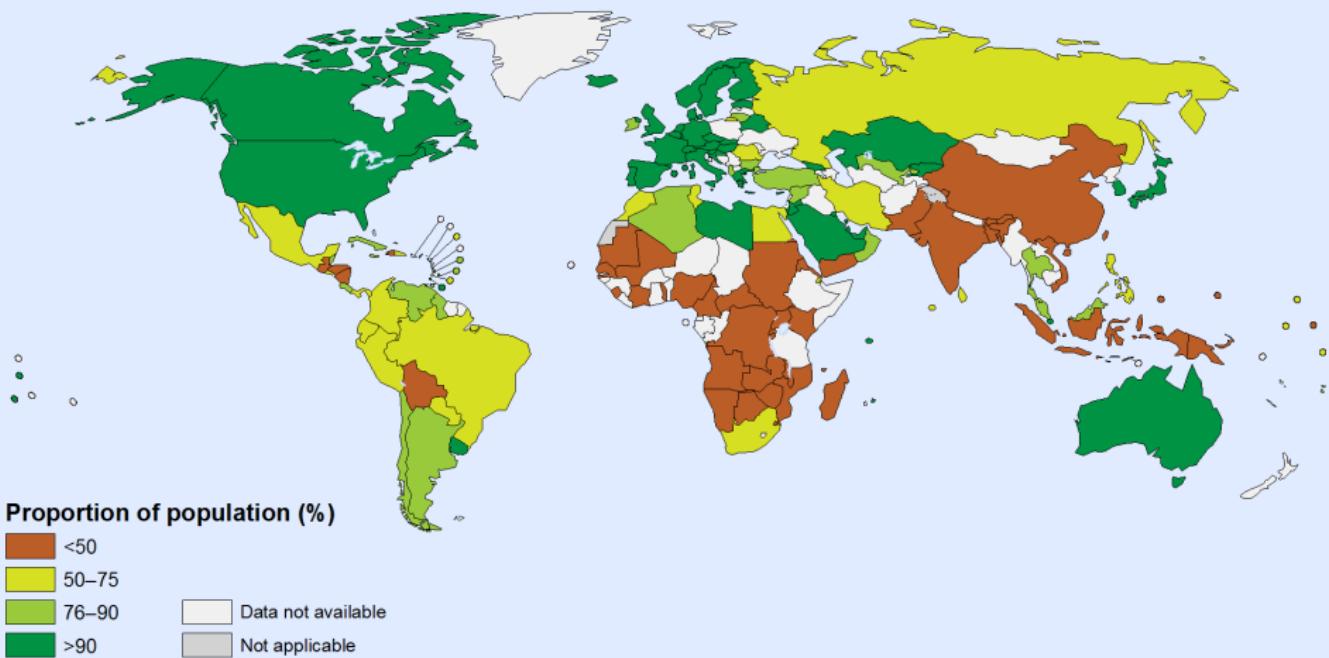
- Modern extinction rates are at 100 to 1000 times greater than background extinction rates calculated over the eras [1].
- Existing species go extinct at a rate 1000 times that of species formation\*.
- The primary cause of today's loss of biodiversity is habitat alteration caused by human activities.

\*<https://www.nature.com/scitable/knowledge/library/conservation-of-biodiversity-13235087>

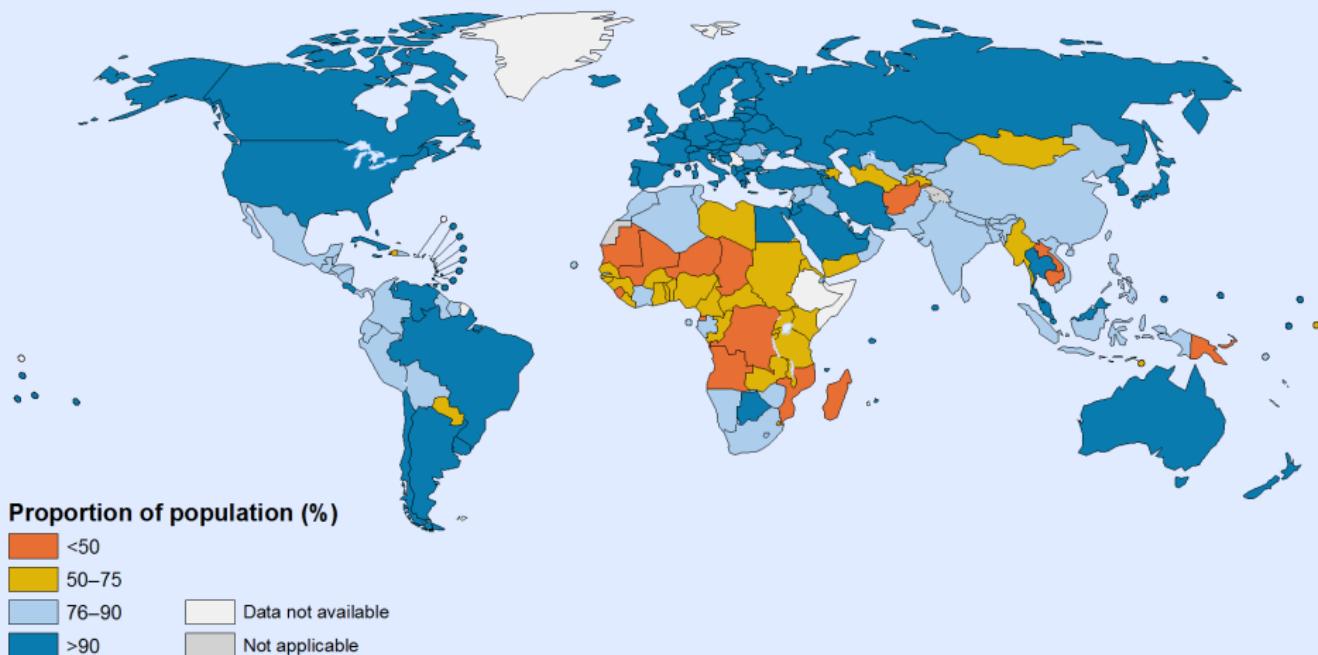
# Proportion of population using improved drinking water sources (%), 1990



# Proportion of population using improved sanitation facilities (%) (%), 1990



# Proportion of population using improved drinking water sources (%), 2000



Proportion of population (%)

<50

50–75

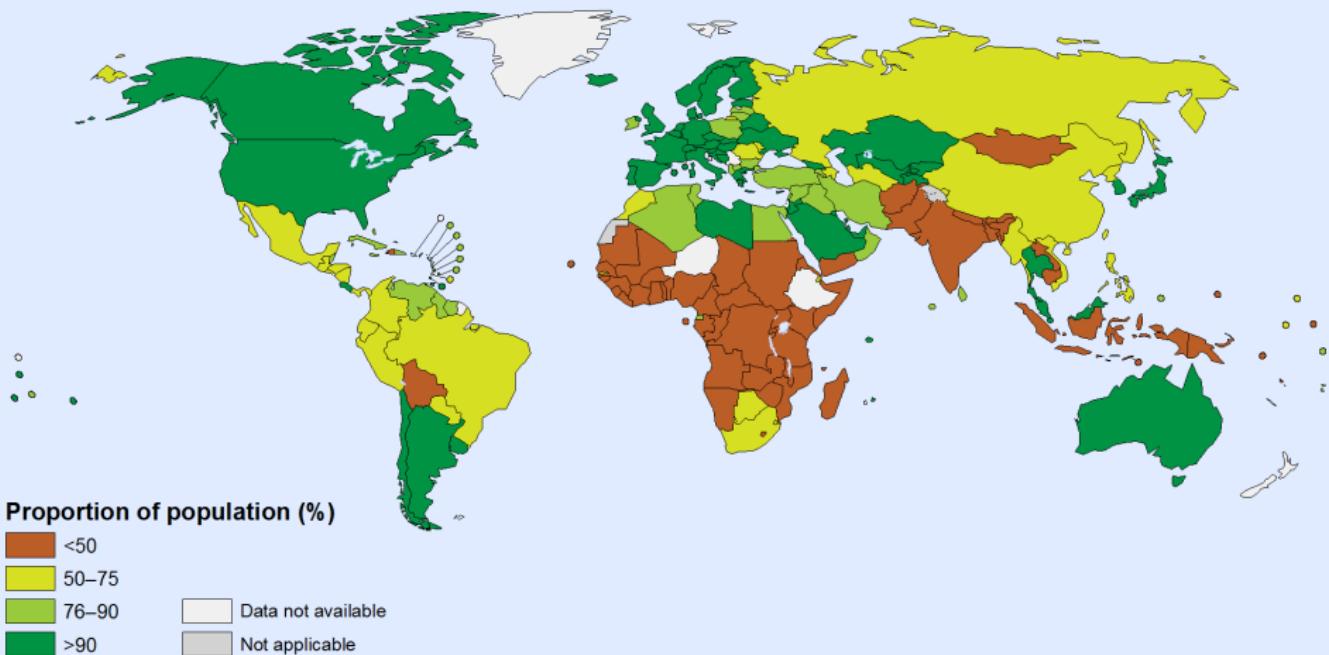
76–90

>90

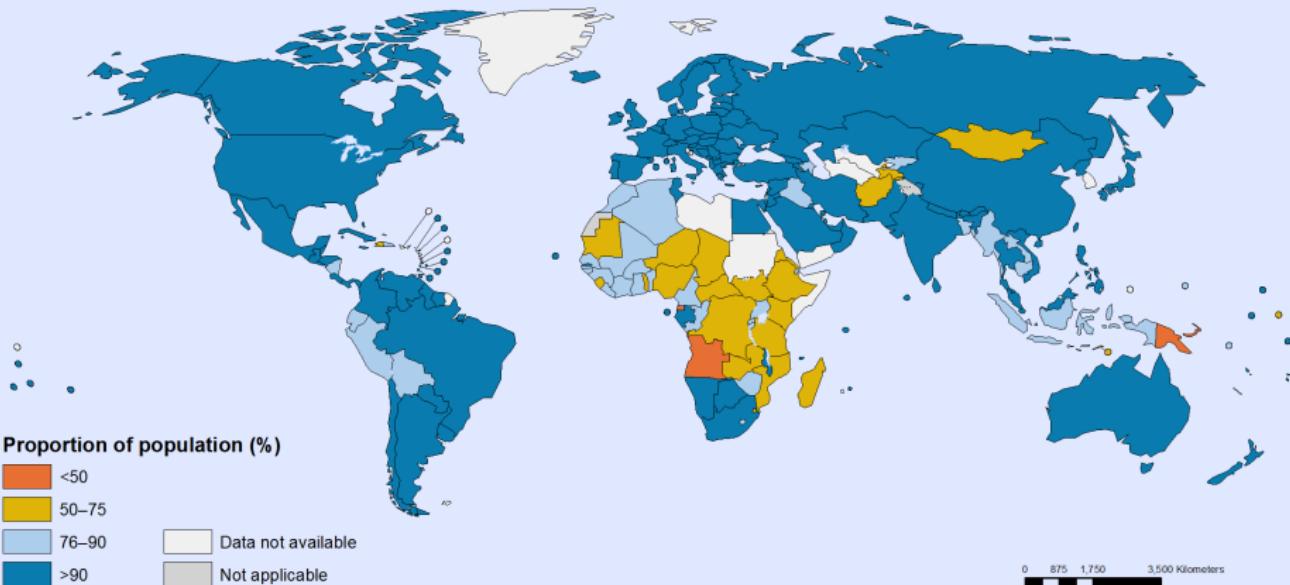
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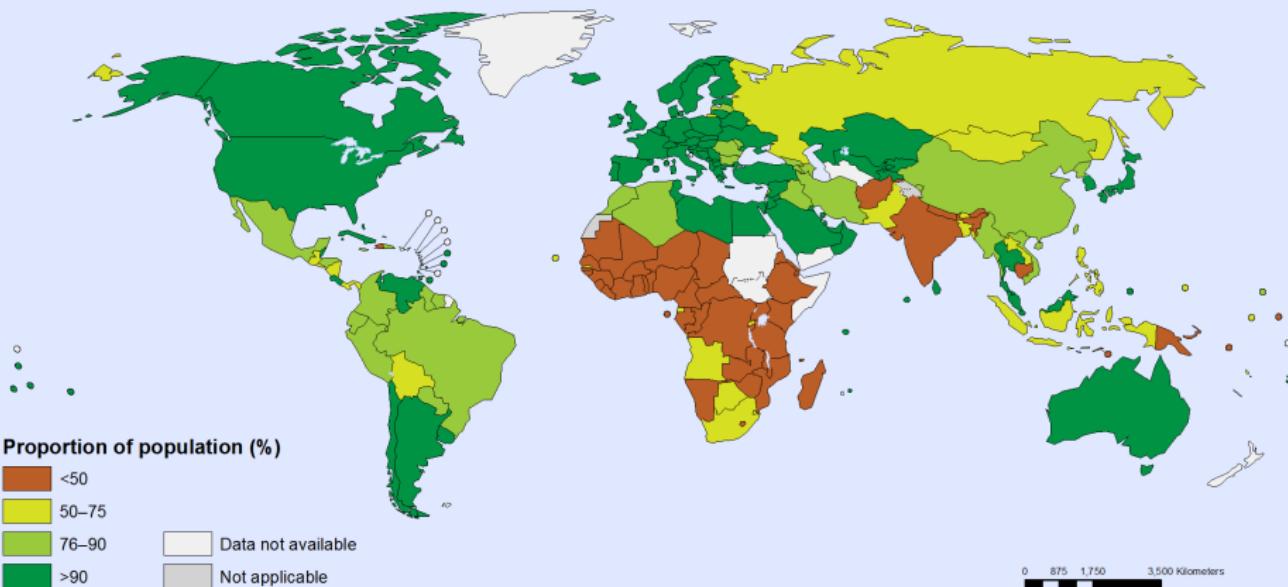
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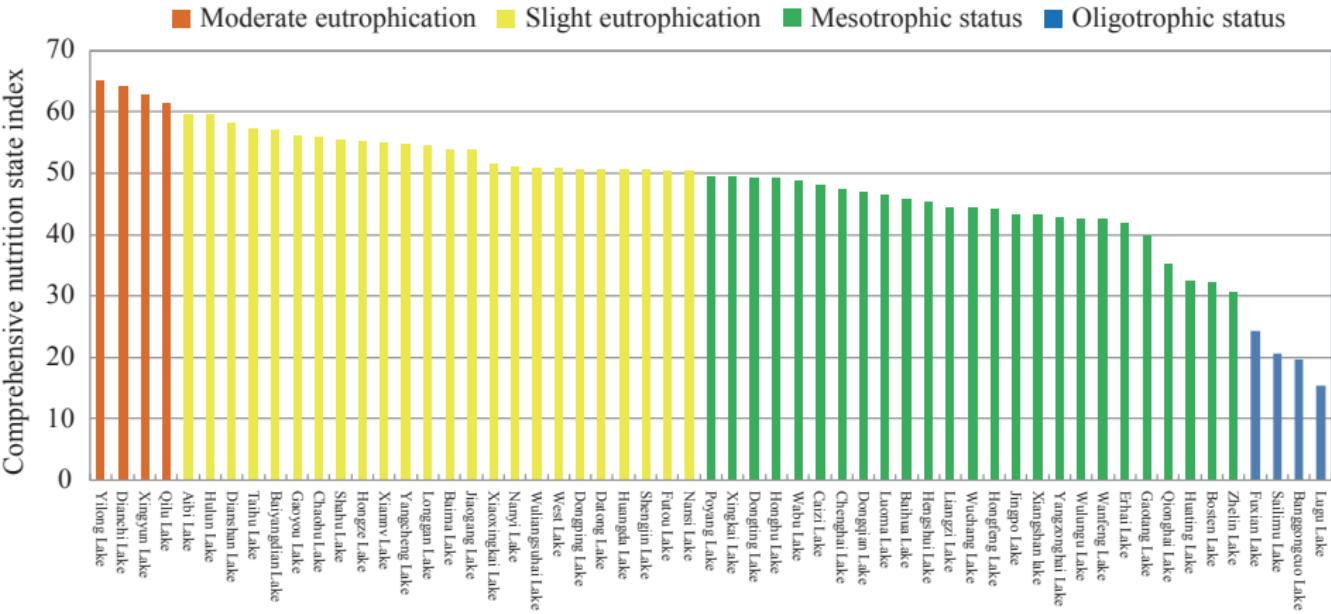
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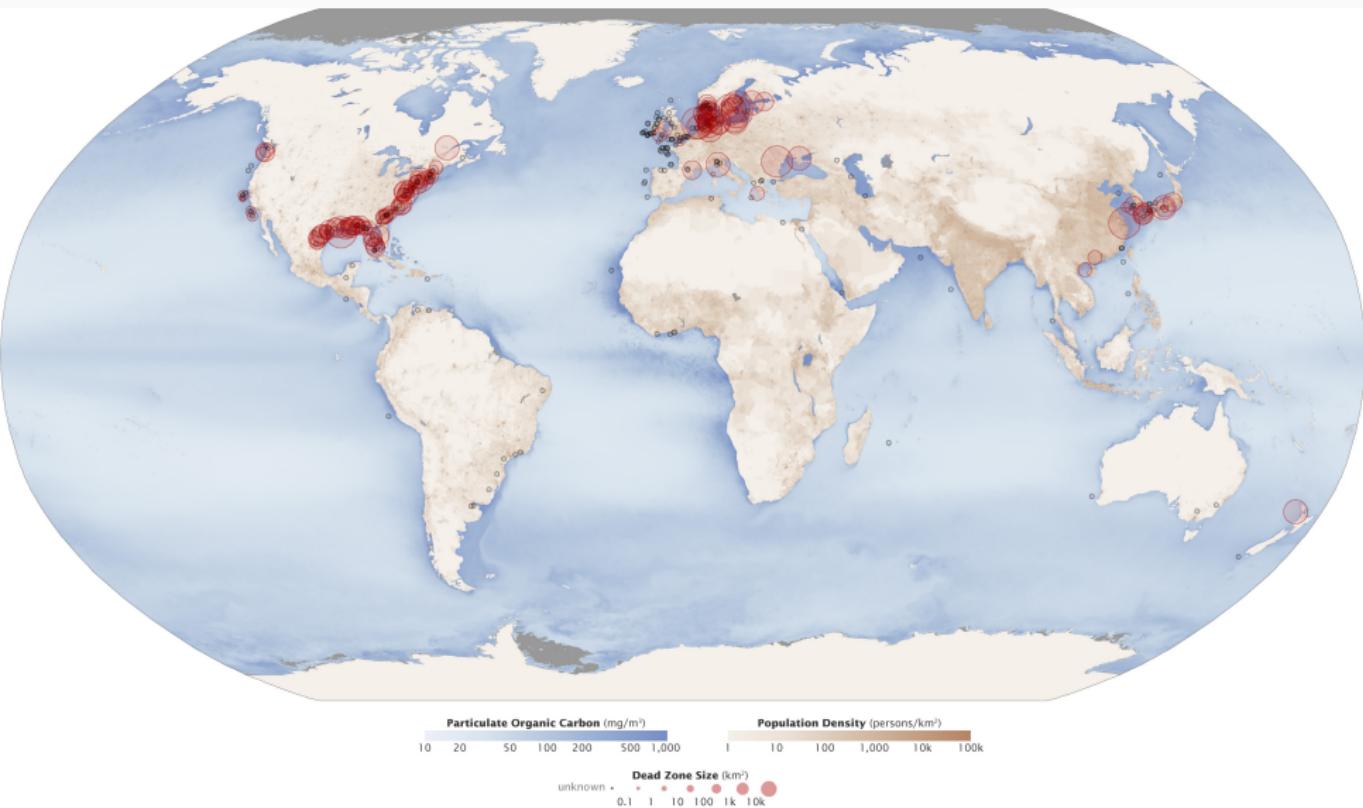
# Proportion of population using improved sanitation facilities (%), 2015



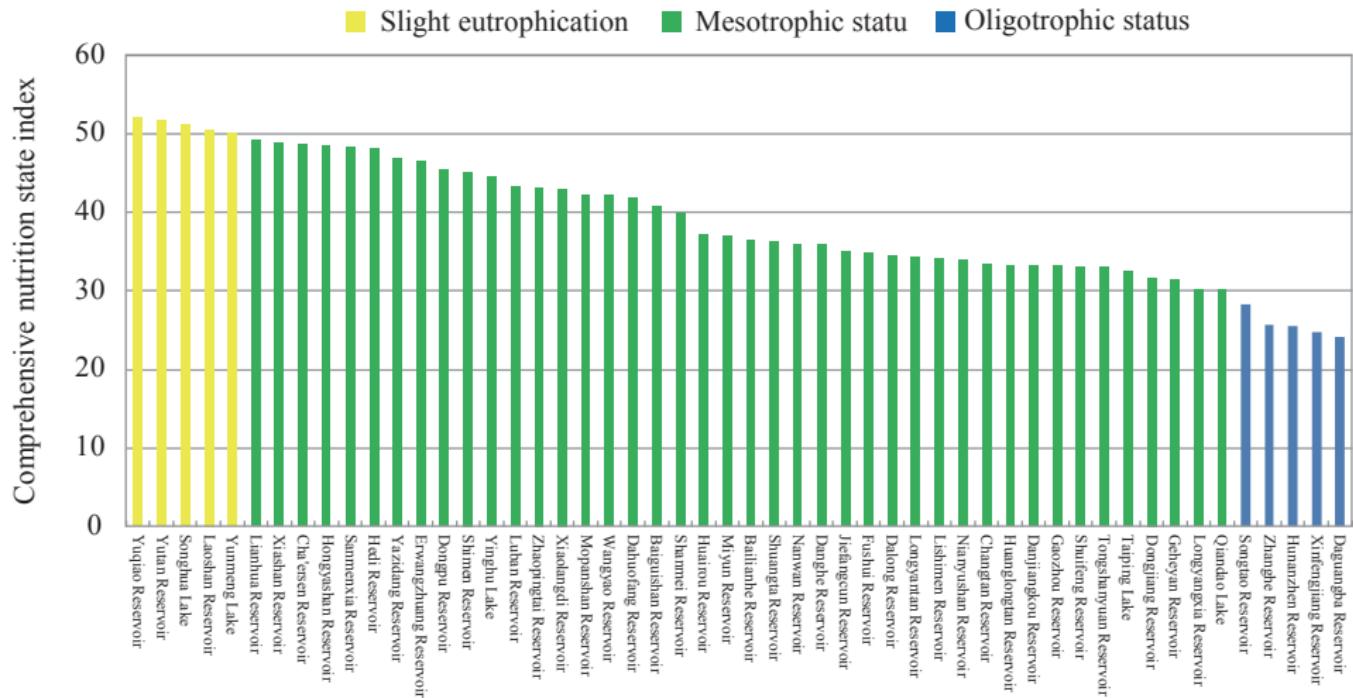
# Trophic level index of China's major lakes in 2017



# Dead zones around the world



# Trophic level index of China's major reservoirs in 2017



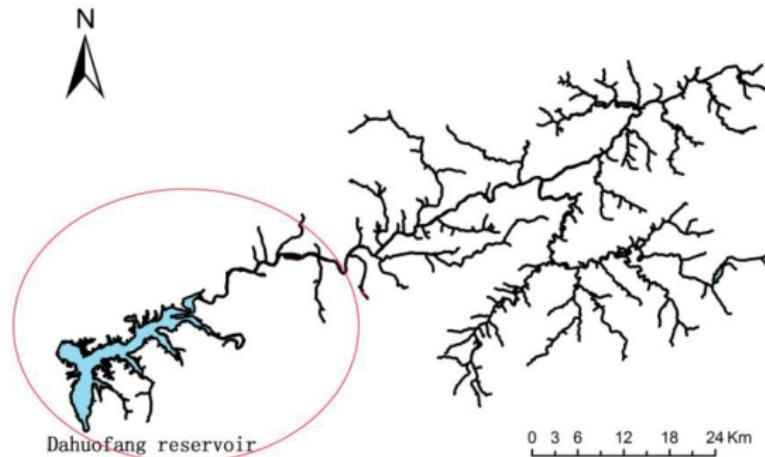
## Situation & Problems

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# Current situation



- Water source of city group in the lower reaches
- $110 \text{ km}^2$ , 7 bil.  $\text{m}^3$  water for 12 mil. people per year



## Main problems

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- Water pollutants: NH<sub>3</sub>-N (9.73 mg/L, 3.87 times higher) and TP (0.84 mg/L, 1.1 times higher)

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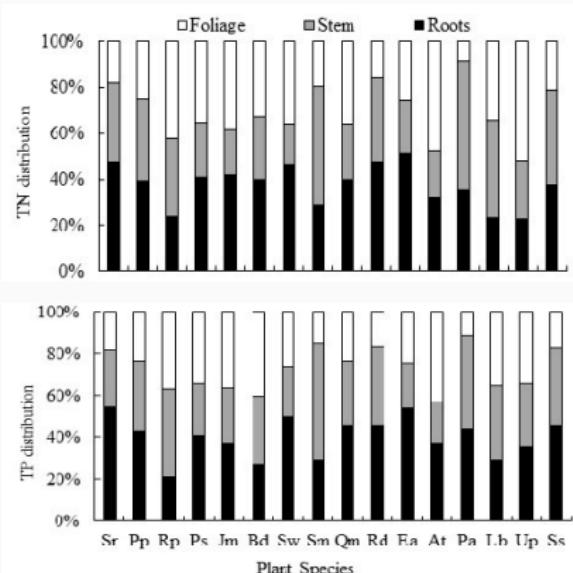
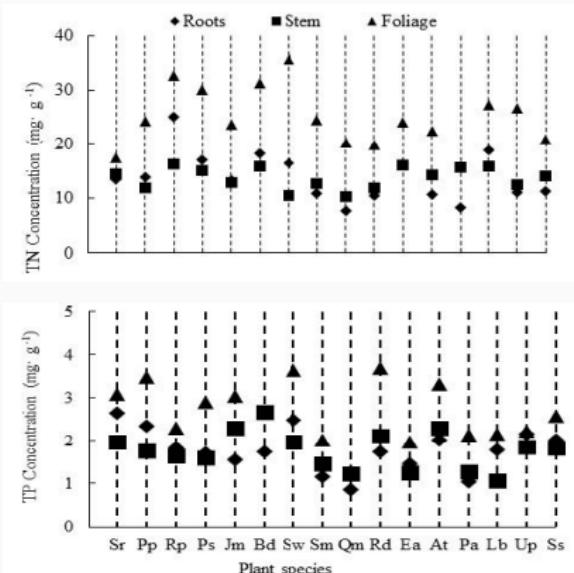
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- Water-conservation-stands (WCS) structure single and simple, ecological functions lost



# Solutions

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# N, P accumulation ability



**Figure 1:** Concentration and distribution of total nitrogen (TP) and total phosphorus (TP) in plants. [3]

# Effects of stand structure on species diversity and water-holding capacity

**Table 1:** Effects of stand structure on species diversity and water-holding capacity

Treatment	Species number						Water storage ( $t/hm^2$ )	
	First year			Second year			Total	Non-capillary
	Herb	Shrub	Tree	Herb	Shrub	Tree		
CK	3	7	14	3	7	15	1022	220
Weak	3	7	15	3	8	16	1054	260
Medium	4	8	16	4	8	18	1085	295
Intense	4	8	18	5	10	20	1100	324

# Application

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## Demonstration projects

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There were three demonstration projects.

## Take home message

The study was successful. But it was expensive.

# Questions?



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**Thanks for listening!**

## Personal thoughts

Conservation is very complicated. It involves many things and corporation.

## References i

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