

# Monitoring amphibian populations

*Using biotic and  
abiotic parameters for  
monitoring ponds*

by  
*Leif Gjerde*

# Fieldwork

- Mapping status of *Triturus cristatus* in Oslo
- Long term monitoring of *Rana temporaria* and *R. arvalis* populations and spawning sites in Oslo and the Øyeren-delta
- Distribution of *T. cristatus* in Eda municipality





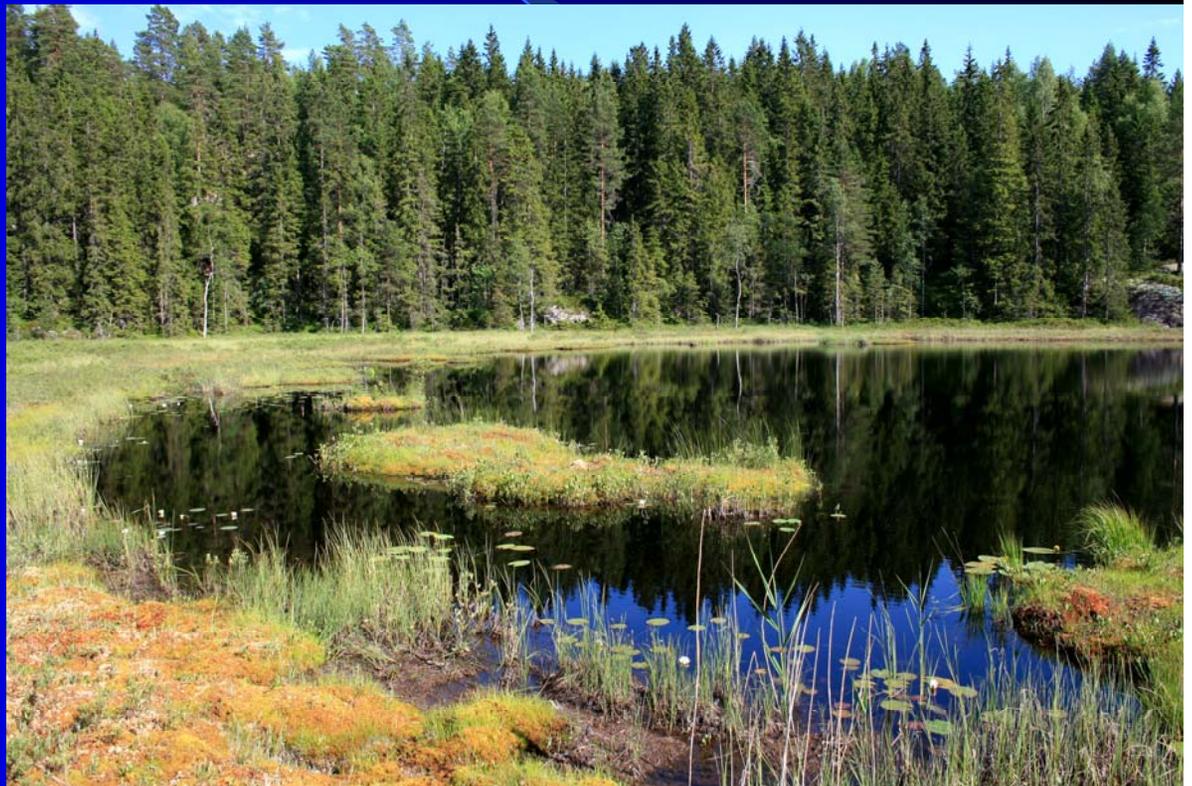
# Forest areas

## Status

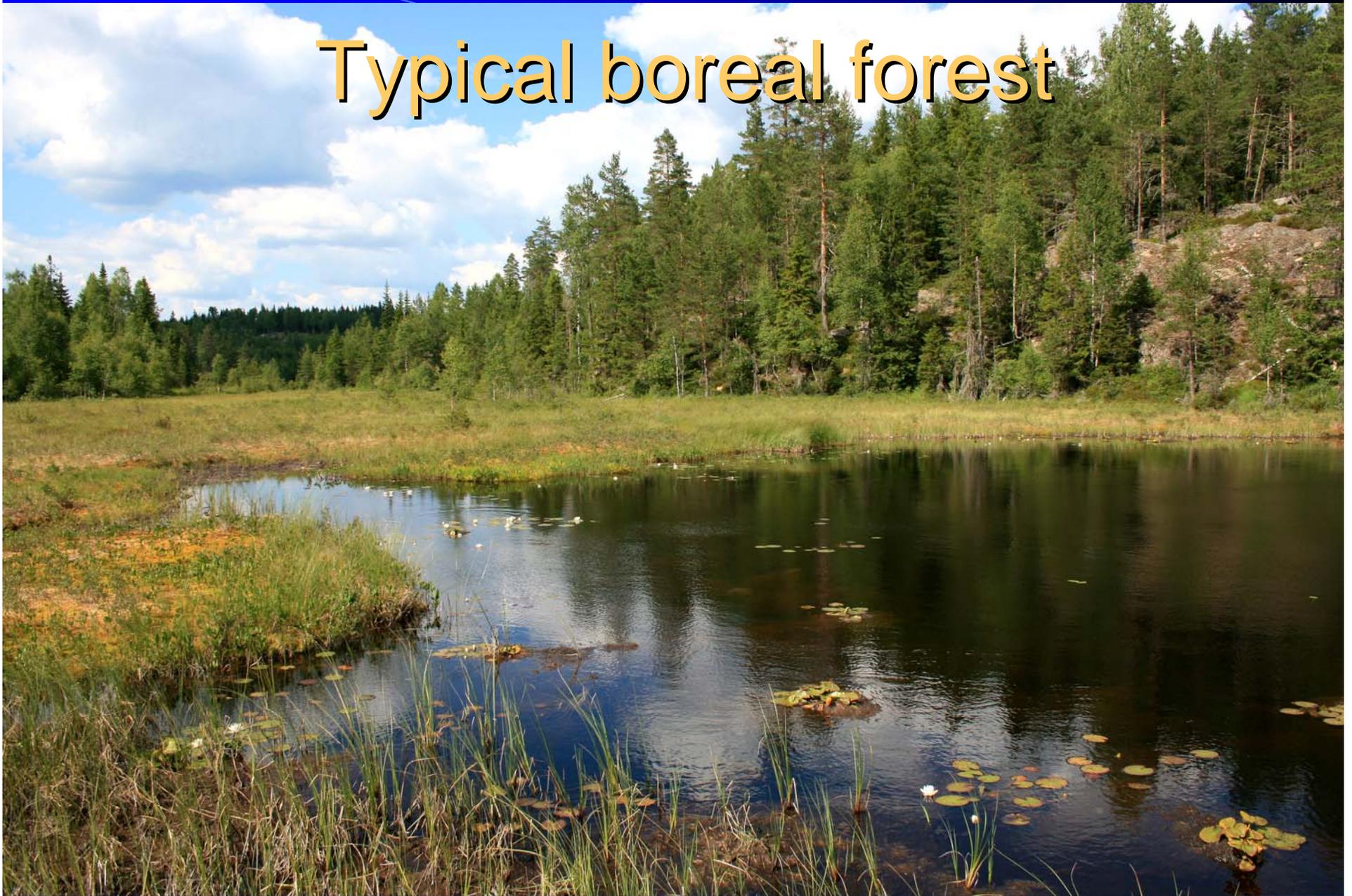
- Frequent with lakelets
- Many *Sphagnum*-bogs
- Amphibians are abundant

## Threats

- Introduction of fish
- Draining bogs for forestry



# Typical boreal forest



# Agricultural areas



## Status

- Few ponds
- Few amphibians

## Threats

- Isolation
- Small fragile populations
- Introduction of fish
- Ponds being filled

# Urban areas



## Status

- Few ponds
- Few amphibians

## Threats

- Isolation
- Small fragile populations
- Introduction of fish
- High mortality from traffic

# Monitoring objectives

## **Population sustainability**

- Size
- Dynamics
- Metapopulation

## **Method**

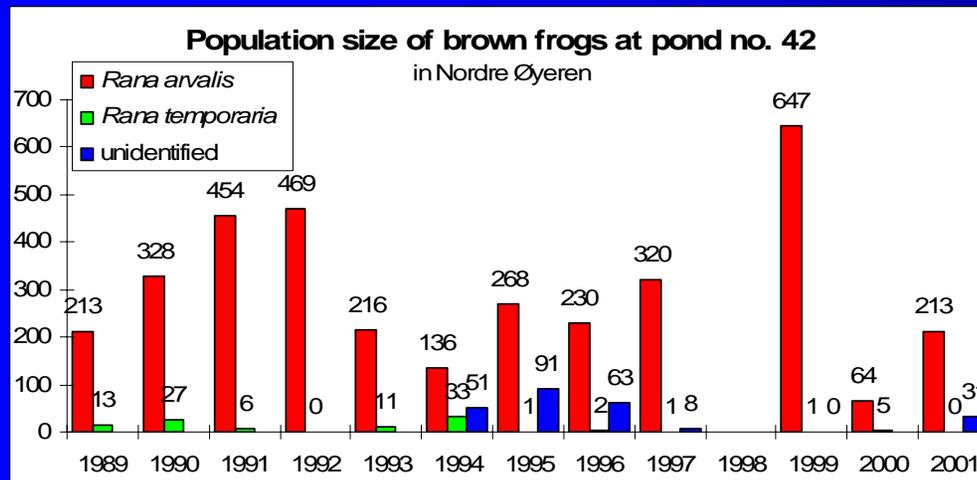
- Relative population size
- Qualities of habitat

## **Cause**

- Change of habitat
- Climate
- Human interference

## **Assess necessary measures**

# Monitoring population

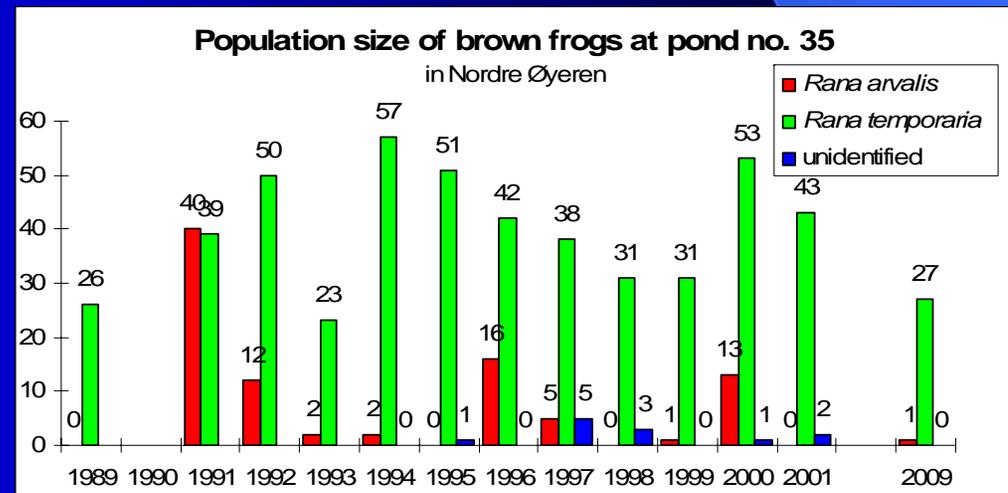


## Advantages

- Accurate population numbers
- Recognize population fluctuations and trends

## Disadvantages

- Population fluctuate much between years – poor parameter
- Require much fieldwork
- Short season





# Monitoring habitat

## Advantages

- Address the parameters that influence population
- Time effective
- Give information of metapopulation
- Relative population measured

## Disadvantages

- Give no absolute numbers
- Population fluctuations and trends not recognizable

# Photo documentation



# Parameters

## Abiotic

- Sun exposure
- Shoreline gradient (%)
- Drainage system
- Substrate (%)
- Water quality

## Biotic

- Amphibian species
- Fish
- Vegetation cover (%)
- Plant species

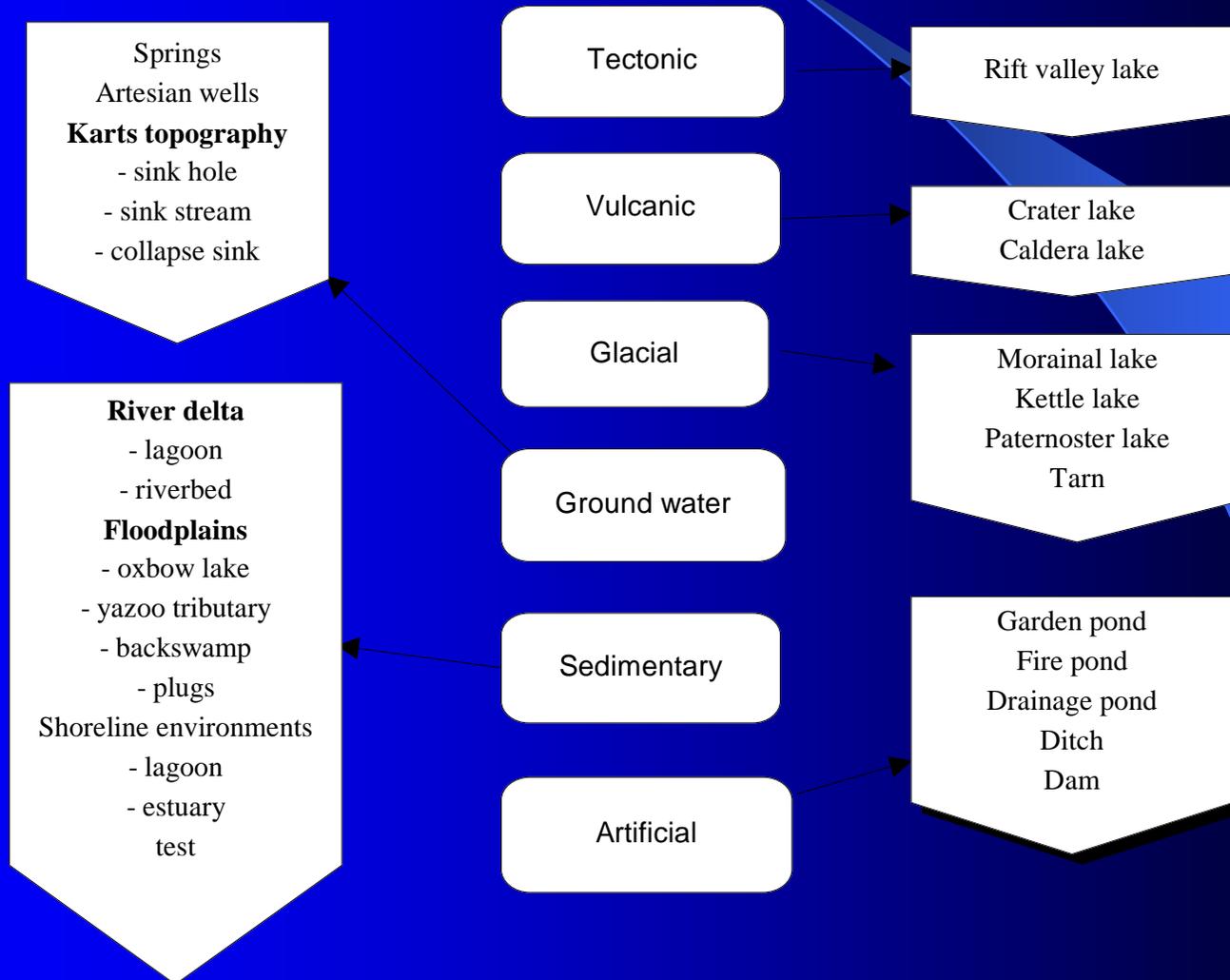
## Isolation

- Metapopulation
- Isolation
- Wetland corridors

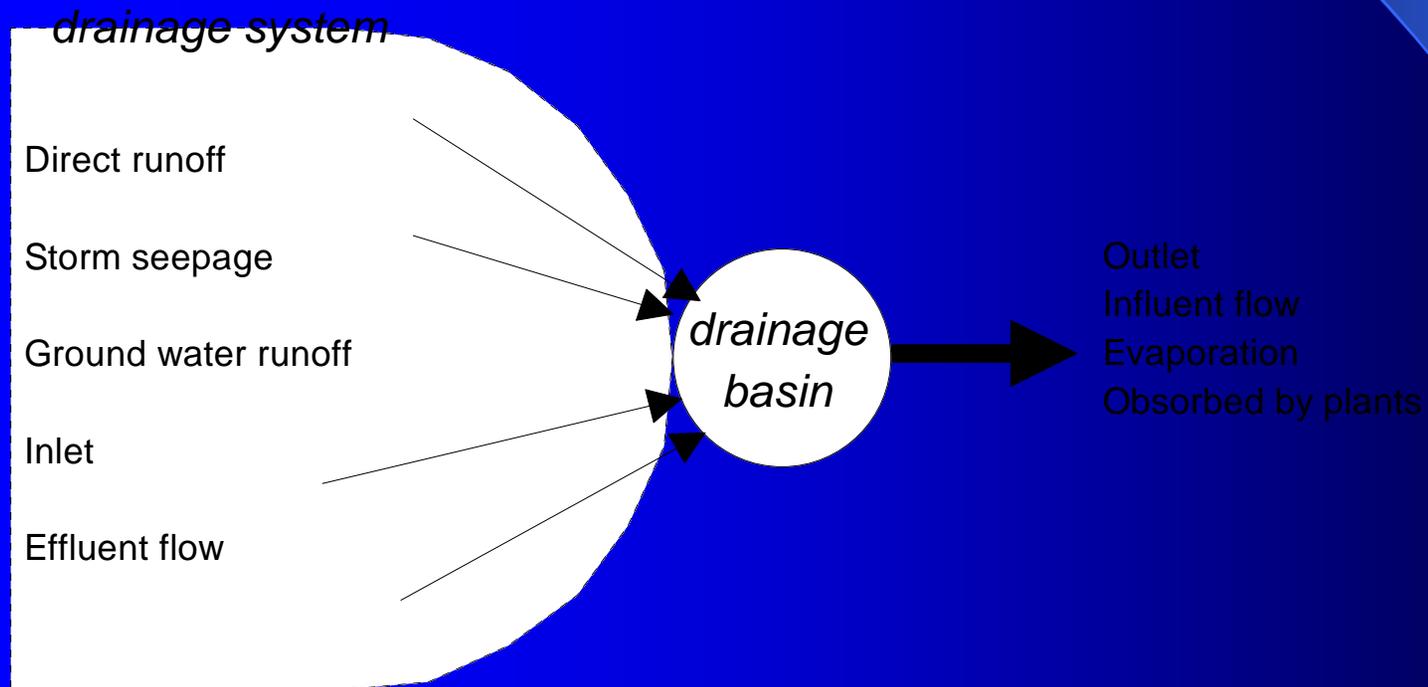
## Human interference

- Threats
- Management practice
- Land use
- Runoff from road/agriculture

# Origin and age



# Drainage system



# Conclusion

- Monitoring habitat can be more cost and time effective than monitoring populations
- Habitat dynamics is crucial when interpreting population threat
- Information on what parameters influence habitat, and why, is essential to assess any measures for population improvement

# Acknowledgements



- The Foundation Norsk Naturarv
- Nordre Øyeren Biological Station
- Eda municipality and Värmland län