

**In the office! The nature conservation group on a hard day!**

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An aerial photograph of a mountainous landscape. The top half shows a steep, rocky cliff face with some sparse vegetation. Below the cliff, a river flows through a valley, surrounded by dense green forest. The river's water appears slightly turbid. The overall scene is a natural, rugged environment.

# **HOW TO CONSERVE THE NATURAL AND CULTURAL ECOSYSTEM SERVICES IN THE VERDON CATCHMENT?**

MASSIF Project - Alternet Summer School  
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# Description of the catchment

- Verdon basin belongs to Alps de Haute-Provence with 6.935 km<sup>2</sup> area and less than 20 inhabitants per km<sup>2</sup>.
- Altitude ranges from 260 to 3.051 m, and the highest peak is Mont Pelat (3.051 m)
- Vegetation varies from typically Mediterranean holm oaks and olive trees to sub-alpine pitch pines, spruces and alpine meadows, beech trees and Scotch pines.

# Description of Flora and Fauna

High diversity of fauna and flora:

- *Bearded vulture, snow rabbit, chamois, little bustard, bats, wolves, butterflies (Parnassius apollo).*

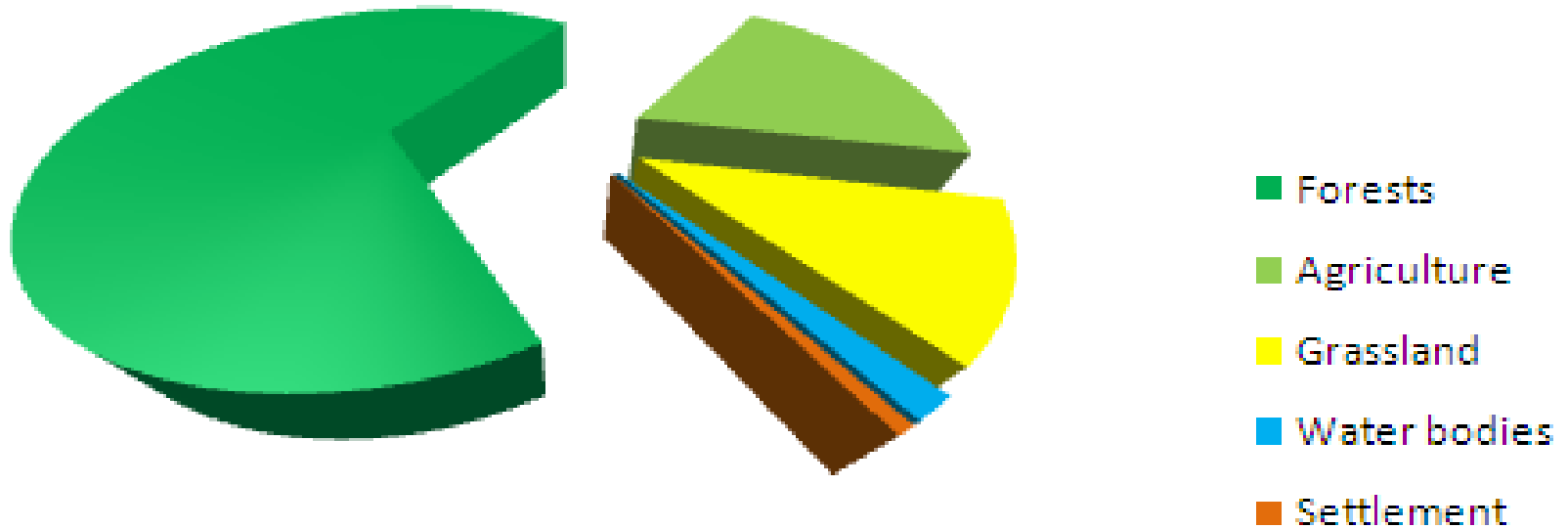
- Over one third of France's flora is represented within this territory:

*Gentiana verna, Astrantia major, Orchis mascula, Nigritella nigra.*

....Mushrooms!



# Coverage of main habitat-types





# Ecosystem Services

- Forest

- Climate regulation
- Erosion control
- Water flow
- Biodiversity/habitat

- Grassland

- Sheep (Herd/Area)
- Habitat

- Agriculture

- Food provision
- Recreation
- Pollination

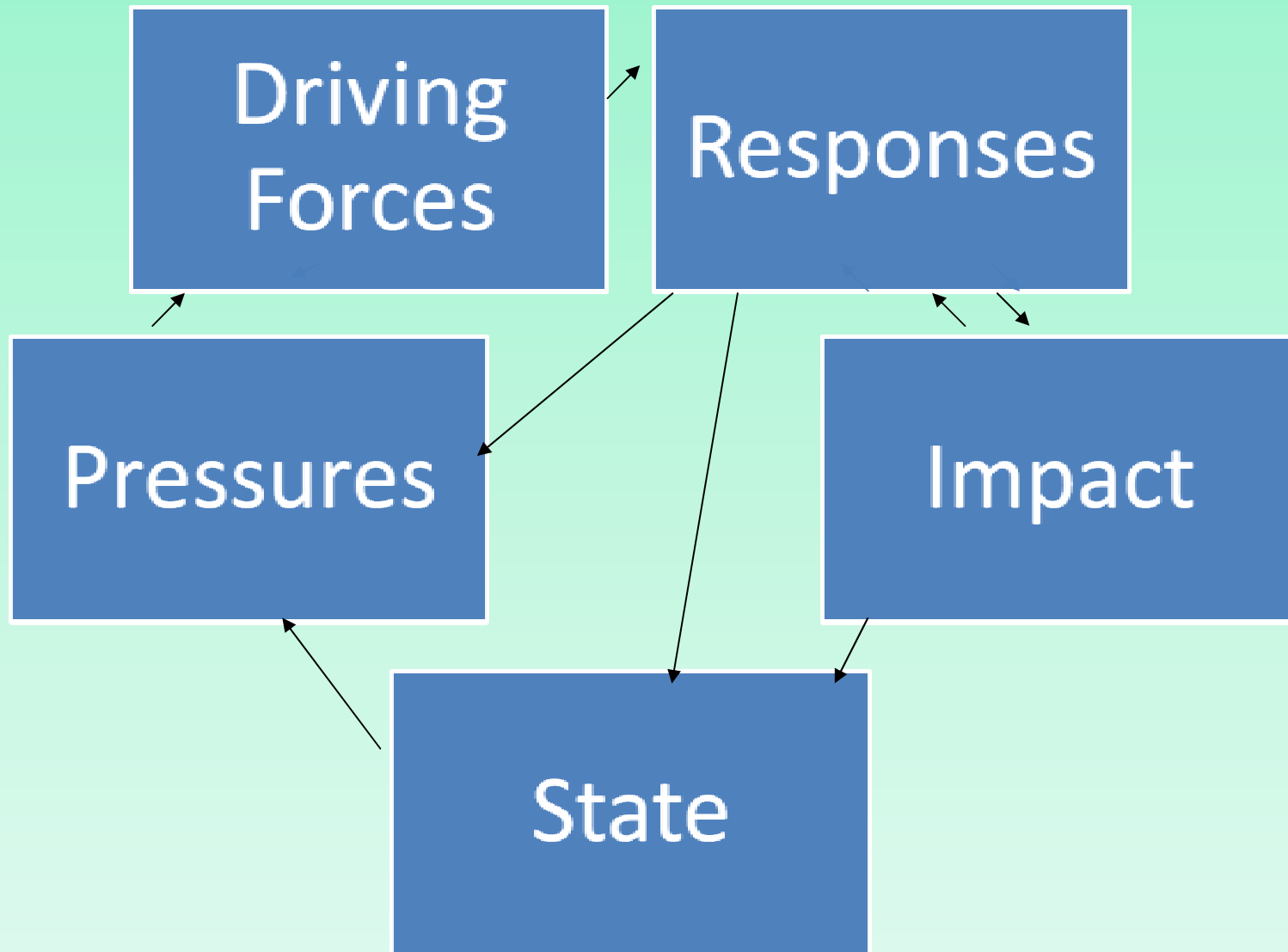
- Water

- Water quality and quantity
- Recreation

- Settlement

- Local population
- Recreation

# DPSIR Approach



# Main Drivers and Pressures

## **CLIMATE CHANGE**

- Higher temperature
- Less precipitation
- More extreme events

## **LANDUSE CHANGE**

- Intensification of agriculture
- Less pasture grassland
- More forest area



# The importance of ES in their habitat

	Landscapes/Habitats				
ES	Forest	Agriculture	Grassland	Water	Settlement
erosion control	+++	+	++		
water flow	+++	+	++		
Biodiversity/habitat	++	+	+++	++	
food provision		+++	+++		
recreation	++	++	++	+++	++
climate regulation	+++		+	++	
pollination	++	+++	+		
sheep			+++		
water quantity and quality	+++	+++	++	+++	+
Population		+			+++

# Vulnerability Assessment – climate change

Temperature	Forests					Agriculture		Grassland		Water		Settlement	
ES	Climate Regulation	Erosion control	Water flow	Biodiversity/Habitat	Pollination	Food provision	Recreation	Sheep	Habitat	Recreation	Water quantity and quality	Population	Recreation
Exposure	+	+	+	+	-	+	-	+	+	-	+	+	-
Sensitivity	+	+	+	+	-	-	-	-	+	-	+	+	-
Adaptation		+	-	+	-	+	+	+	-	+	-	+	+
Vulnerability	++	+	++	+	-	++	-	+	++	-	++	+	-
<b>Less precipitation</b>													
Exposure	+	-	+	-	+	+	+	+	+	+	+	+	-
Sensitivity	+	-	+	+	+	+	+	+	+	+	+	+	-
Adaptation		-	-	+	-	-	-	-	-	-	-	-	+
Vulnerability	++	--	+	+	++	++	++	++	++	++	++	++	+
<b>Extreme events</b>													
Exposure	+	+	+	+	+	+	+	+	+	+	+	+	+
Sensitivity	+	+	+	+	+	+	+	+	+	+	+	+	+
Adaptation	-	-	-	-	-	+	+	+	+		+	+	+
Vulnerability	++	++	++	++	++	+	+	+	+	++	+	+	+

# Vulnerability Assessment – landuse change

Intensification	Forests					Agriculture		Grassland		Water		Settlement	
ES	Climate Regulation	Erosion control	Water flow	Biodiversity/Habitat	Pollination	Food provision	Recreation	Sheep	Habitat	Recreation	Water quantity and quality	Population	Recreation
Exposure	+	+	+	+	-	-	-	-	-	+	+	-/+	-/+
Sensitivity	+	+	+	+	-	-	-	-	-	+	+	-/+	-/+
Adaptation	-	-	-	-	-	+	+	-	-	-	-	+	+
Vulnerability	++	++	++	++	-	-	-	-	-	++	++	-/+	-/+
<b>More Forest Area</b>													
Exposure	+	+	+	+	+	+	+	+	+	+	+	+	-
Sensitivity	+	-	-	+	+	+	+	+	+	+	+	+	-
Adaptation	+	-	-	+	+	+	+	+	-	-	+	+	-
Vulnerability	-	-	-	-	-	+	+	+	++	++	+	+	-
<b>Less Pasture Grassland</b>													
Exposure	+	-	-	+	+	-	-	+	+	-	-	+	-
Sensitivity	+	-	-	+	+	-	-	+	+	-	-	+	+
Adaptation	-	+	+	-	-	-	-	-	-	-	-	+	-
Vulnerability	++	-	+	++	++	-	-	++	++	-	-	++	-

# Scenarios

- Global Orchestration
  - Intensification of agriculture (more irrigation) and industrial infrastructure
    - loss of biodiversity
    - Higher pollution rates in water and soil
  - Bigger sheep herds
    - More erosion in grazing area
    - More forest; less open landscape; loss of biodiversity; spread of bark beetles

# Scenarios

- Adaptive Mosaic
  - More open landscape and small patches of forest
    - Better water quality and water flow control
    - Less water and soil pollution
    - Less erosion and higher biodiversity

# Recommendations/1

- 1- Subsidies only for a sheep herd size or to a certain number
- 2- Do not cut the forest ,climate change leads to more bark beetle (more generations/year) and monocultural forests are threatened to disappear. Keep small patches of mixed forest
- 3- The overall coverage of the forest should not be increased
- 4- No mechanization in the forest (erosion and soil compaction)

# Recommendations/2

5- No intensification of agriculture

6- More organic production (reduction of pesticides)

7- Restrict the clearing and the infrastructure around the waterbodies (bufferzone)

8- Establish an “integrated regional management plan”

Thank you for listening to us!

