

CASE STUDY AREA: Leiria National Forest, Portugal



Case study description

Leiria National Forest (Pinhal de Leiria) is located in Central-Western Portugal, approximately 150 km North of Lisbon. The area covers about 11,000 ha. LNF is intended as representative of state owned forestry systems in Portugal, from which Pinhal (means pine wood in Portuguese) de Leiria is certainly the oldest, largest, and internally better known state forest in Portugal.

Pine saw logs rank very high in the list of ecosystem services provided by LNF. Logs with large diameters harvested from clear cuts are the most valuable asset. Logs with smaller diameters are also provided by thinning or clear-cuts from stands prescribed to be managed according to short rotations.

Coastal and sand dunes protection ranks also very high. Recreation and carbon storage are also important services. The list of ecosystem services includes too wildlife conservation and resin.

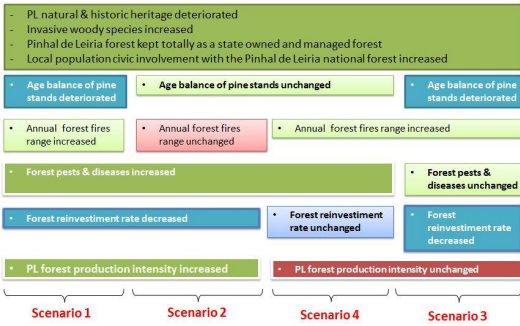
Trade-offs	Ecosystem Services Tradeoffs			
	Pine Wood	Recreation Area	Protection area	Carbon
Pine wood		Competitive	Competitive	Competitive
Recreation area	Competitive		Competitive	Neutral
Protection area	Competitive	Competitive		Neutral
Carbon	Competitive	Neutral	Neutral	

KEY DRIVERS

- Risk of fires
- Pine nematode
- Certification procedures
- Conflict of legislation
- Afforestation vs new plantations

POSSIBLE FUTURE DEVELOPMENTS

Scenarios:



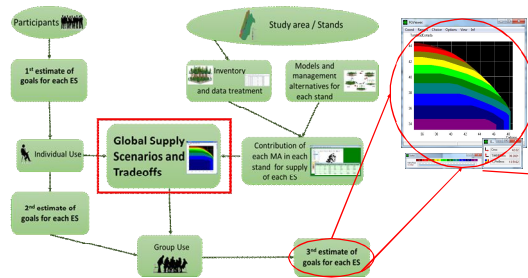
Scenario effects on ES:

Ecosystem services	Scen1	Scen2	Scen3	Scen4
Pine saw logs	Increase moderately (but lower diameter saw logs supply increases)	Increase moderately (but lower diameter saw logs supply increases)	Increase significantly	Increase significantly
Coastal protection	Unchanged	Unchanged	Unchanged	Unchanged
Sand dunes protection	Unchanged	Unchanged	Unchanged	Unchanged

Scenarios	60 years period (2044-2104)							
	Volume of ending inventory (m3) (2104)		Thinned Volume (m3)		Harvested Volume (m3)		Average Carbon (Mg)	
Pine wood	1,28 x 10 ⁶	1,34 x 10 ⁶	0,48 x 10 ⁶	0,41 x 10 ⁶	2,25 x 10 ⁶	2,44 x 10 ⁶	926	1035

DESIRED COMMON FUTURE

- two sequential participatory workshops (PW),
- 1.st PW involving 10 participants (central government (3), environmentalist (1), local civil society (1), cork industry (1), municipality (1), and Integral researcher (4)) aiming at setting the ecosystem services desired end-points
- 2.nd PW, aiming at the elicitation of robust policies, involving 20 participants representing several sectors as: central government (3) environment (2), local civil society (3), pine industry (2), resine industry (2), municipality (2) and Integral researcher (6)
- Policies pool elicitation in two parallel sections each with a different scenario background (scenario 2 and 3), followed by a plenary section for robust policies identification



Ecosystem Services	Units	Goals (90 years)
Pine timber	m ³	3,75 x 10 ⁶
Recreation area	ha	53
Protection area	ha	3631
Average Carbon stock	Mg/year	45109

Management program	Currently	Scen1	Scen2	Scen3	Scen4	Stakeholders' goals
Prog1	67%	46.0%	46.0%	66.0%	66.0%	52.0%
Prog2	0.0%	20.0%	20.0%	0.0%	0.0%	11.7%
Prog3	33.2%	33.2%	33.2%	33.2%	33.2%	35.5%
Prog4	0.2%	0.8%	0.8%	0.8%	0.8%	0.8%
Total	100%	100%	100%	100%	100%	100%

RECOMMENDATIONS FOR ACTIONS

Scenario 2 Parallel Section Results:

Scenario 3 Parallel Section Results:

Plenary Section Results:

Policies	Obstacles/Opportunities	ES services affected
Adopt a forest management certification scheme	Absence of management certification	AI
Improve articulation amongst the central and the presentation agents	Risk of fire	AI
Improve the production strategy	Insufficient forest reinvestment (from 20% now 2%) => increase risk of fire	AI
Implement corrective reinvestment for a 4-5 years period	Insufficient forest reinvestment (from 20% now 2%) => increase risk of fire	AI
Establishment of non-institutional formal partnerships agreements involving CNF, municipalities, universities, and civil society organizations, including collective applications to project funding	PLF management (Dad) not open to local municipalities or civil society contributions	AI
Supports on timber production	Private on-site production village (pines) 25 km ² (50 km ² forest) Available for funding to forest disease control projects	AI
PLF funding applications to address issues of forest pest and diseases and timber species	National and international wood management value of "lower" pine as a specie	AI
Multiple associations (CNF) to promote further PLF brand value, segment recreational area and infrastructure	National and international wood management value of "lower" pine as a specie	AI

Actions	Responsibility	Type of action	Time frame	Influences
Adoption of a forest management certification scheme	PLF management board (ICNF – public entity)	PLF management internal policy with budgetary implications	5 to 30 years	Central government (relevant Ministry)
Formal or informal improved articulation between institutional and civil society organizations acting on PLF	PLF management board, local municipalities (Marinha Grande, Leiria), University, local civil society organizations	Readjustment of involved entities internal policies	5 to 30 years	Central government (relevant Ministry)
Promote applied research directed to PLF issues (forest pest and diseases, invasive species control)	PLF management board, University, Foundation for Science and Technology (FC – public entity)	Financial	5 to 30 years	Central government (relevant Ministry), EU
Promote awareness and educate use of PLF heritage (local, regionally and nationally)	PLF management board, local municipalities (Marinha Grande, Leiria)	Communication campaign	5 to 30 years	Central government (relevant Ministry), local civil society organizations

Conclusions and Discussion:

- Participants without necessary skills and information to reliably discuss and decide preferred ecosystem services targets, major obstacles and opportunities for targets, and needed policies;
- Problem partially overcome supplying participants with a decision support tool such as the Pareto Frontier one, as we did;
- Even with participants with right skills and information, length of time of a two day session (end-points setting + back casting) too little to arrive at reliable results;
- Methodological option of retaining only policies elicited simultaneously in all scenario discussions put aside policies that might be also relevant, as acknowledged by participants;
- What if policies advocated by participants were not consistent with the scenario itself, as was the case for the rate of reinvestment into public forests (governmental policy)? An implication is that the earlier factors and manifestations identification stages should not include forest policies.