

ACTION 5. Revision of forest management plans at four sites

In the framework of the LIFE+ AdaptFor Project the appropriate forest management measures that would facilitate and enhance adaptation to climate change (proposed by Action 4) have been further specified at stand level¹ and subsequently incorporated into the Forest Management Plans (FMPs) of the four study areas. In specific, revision of FMPs applied in the cases of Pieria and Aspropotamos Forest and drafting of new FMPs proved necessary for Dimotiko and Dimosio Kastanias (Kalampaka), Parnitha and Taygetos.

The Forest Management Plans are the tool of each Forest Service, as they actually indicate the management practices to be applied for each forest, providing the necessary information on how to plan and implement projects, actions and interventions. They have ten years duration and are drafted according to specific standards.

The first step in the revision or drafting of FMPs was to define the exact area that these management measures would apply to, in each of the four pilot sites. This included: a) optimisation of study areas' polygons, delineating them in detail in order to follow the limit of natural barriers or the outer limit of the peripheral forest stands and b) selection of forest stands that should be included in or excluded from this process, based on their dominant vegetation type, the management practices applied so far (clear cuts, coppicing or even no management), land use status (e.g. stands granted for agricultural or grazing activities) and suitability in terms of occurrence of the observed phenomena (conifers' diebacks or conifer invasion in broadleaved forests).

The second step was the specification of the adaptation measures, i.e. which adaptation measure or combination of measures were to be applied to each forest stand, depending on site quality, vegetation, stand health, regeneration rate, occurrence of disturbances (e.g. stands affected by insects' outbreaks or by forest fires) etc.

The third step was the inclusion of measures in the Stand Specification Sheets. At this point, specific decisions on issues such as the extension of rotation period (often by many years) and subsequent increase in growing stock and annual increment, definition of forest age structure, application of sanitary loggings, promotion of a certain dominant vegetation type at each stand, etc. were further defined. The silvicultural methods/practices to be applied in order to achieve the above were specified as well (e.g. inversion thinning by applying positive or negative selection etc.).

New forest maps were produced or the old ones were updated (data with geographic reference through the use of Geographical Information Systems).

Once the FMPs had been finalized, they were submitted to the Regional Forest Directorates who are responsible for their approval.

Data, results and intermediate outputs of the project proved to be very useful in the drafting of the General Part (description and assessment of the competent area) of the FMPs as well. More specifically, per study area, the following took place:

¹ The forest stand is the smallest unit of forest division and the implementation unit of silvicultural treatments.

Ritini–Vria Forest at Mount Pieria (FDP): 21 forest stands (1,422.20 ha)

The revised FMP focused on the conservation of Scots pine forest through prevention of tree dieback. Furthermore, the conservation of the species subpopulations (genetic diversity) was defined as significant, as the region is the southernmost limit of Scots pine in Europe.

The previous FMP had expired in 2010 and thus the drafting and approval procedures of the new FMP (period 2011-2020) for the pilot site Ritini-Vria Forest overlapped with the project implementation. In specific, as the project had already progressed significantly by the time of the FMP renewal, the new FMP had been drafted in line with the project objectives and based on its first results. The new FMP was approved on 03.01.2012. This FMP was then revised to incorporate the adaptation measures according to the results of Action 4. The revision of the FMP was approved in 17.11.2014.

Kalampaka-Aspropotamos Forest (FSK): 41 forest stands (2,087.70 ha)

The revised FMP focused on the halting of conifer species intrusion into stands where broadleaved species normally prevail. Specifically, at medium and poor quality sites where fir individuals extend beyond their lower thermal tolerance limits, and consequently become vulnerable to insects' attacks, rehabilitation of the mixed oak forest (Dimosio Kastanias) and of the chestnut forest (Dimotiko Kastanias) was proposed. However, at specific good quality sites within the area, fir stands should be favoured (Aspropotamos).

In this area, Action 5 involved the drafting/revision of three FMPs instead of one, as the study area included two State forests (Dimosio Kastanias and Aspropotamos) and one private forest (Dimotiko Kastanias). All three forests are being managed intensively for wood production and the local communities depend strongly on logging activities. Thus, this area was actually the most difficult to handle when it came to altering management objectives (into more sustainable forest management).

Dimotiko Kastanias: As this is a private forest, the FMP was drafted by an external forester (hired from the forest's owner, i.e. the Municipality) and then verified by the FSK and approved by the Regional Forest Directorate (standard procedure for private forests' FMPs). At its verification report, the FSK made a clear reference to the project and the proposed measures for the area, and suggested to the higher authorities the approval of the FMP put forward by the Municipality on condition that the adaptation measures of the AdaptFor project would be adopted. The FMP (validity period 2014-2018), drafted within the project duration was approved on 17.09.2014. FMPs for private forests have a five-year duration.

Dimosio Kastanias: The FMP (validity period 2015-2024) was drafted in the framework of the project and was approved on 17.12.2014.

Aspropotamos: The current FMP of Aspropotamos forest expires in 2015 (one year after the end of the project) and the majority of its forest stands have been already managed (subjected to silvicultural treatments) during the past nine years. This fact rendered them inappropriate for the implementation of adaptation measures in 2015. Specifically, in what concerns the project area, 25 out of 29 forest stands were found inappropriate for any kind of management treatment within 2015. To overcome this obstacle for these 25 stands, the FSK incorporated the project measures to the current FMP (through revision procedures) with an explicit mandate that these measures would be included in the next FMP (validity period 2016-2025) and subsequently

implemented during the next 10-year period. Regarding the four remaining stands, the adaptation measures are going to be implemented in 2015, as scheduled. The revision of the FMP (validity period 2006-2015) was approved in 17.12.2014.

National Park of Parnitha (FSP): 11 forest stands (16,323.93 ha)

The FMP of Parnitha focused on the protection of ecosystem functions against climate change driven disturbances. In this particular area, forest management is focused on the protection of biotic (conservation of biodiversity) and abiotic factors (improvement of soil conditions, water economy) and not on wood production. Specifically, in what regards management objectives, at good quality sites the conservation of Greek fir was promoted. On the contrary, at degraded sites where fir lies outside its ecological tolerance limits, the objective was to replace fir by other autochthonous species, more adaptable to marginal conditions.

The previous FMP expired in 2006 and since then the FSP operated without one. Many reasons did not allow for the drafting of a new FMP for the area. As clearly mentioned in the FMP's introductory section, the current FMP was not only drafted in the framework of the project but also thanks to the project. The general adaptation measures (limitation of grazing, fire prevention measures, protection of soil resources, public awareness etc.) apply to the whole area of the FMP competency (11 forest stands). Measures intended for degraded soils or burnt areas apply to forest stand No4 (2,347.84 ha), while measures intended for sites of better quality apply to forest stand No5 (3,326.30 ha). The FMP (validity period 2015-2024) was approved on 18.12.2014.

Mount Taygetos (FSS): 55 forest stands (13,055.30 ha)

The FMP focused on the protection of Greek fir against bark beetles and other insect outbreaks. Specifically, the favouring of fir stands (both *A. cephalonica* and *A. borisii regis*) under single-selection silvicultural form was proposed, as this structure creates a forest with high wood stocks, stable equilibrium and greater sequestration and storage capacity of CO₂ (climate change mitigation). The conservation of the genetic diversity of Greek fir was defined of significant importance, as the region is the southernmost species' limit in Greece.

The previous FMP expired in 2012 and ever since the FSP operated without one. Many reasons did not allow for the drafting of a new FMP for the area. However, in the framework of the project, an FMP was drafted incorporating the project outputs and results for the area. The FMP (validity period 2015-2024) was approved on 18.12.2014.

As shown in the Table below, the revision/drafting of the FMPs finally affected an area twice as much as the area initially planned.

Area (ha) and forest stands affected by the revision / drafting of FMPs, per study area.

Study Area	Initially intended	Finally affected	
	Area (ha) (+forest stands -fs, where applicable)	Area (ha)	Forest Stands (fs)
Ritini-Vria Forest	~ 1.500	= 1.422,20	21 fs: (1α, 1β, 2, 3α, 3β, 3γ, 6α, 6β, 7α, 7β, 8α,

at Mount Pieria			8β, 9β, 10β, 10γ, 11β, 12β, 22γ, 23α, 23β, 23γ)
Aspropotamos-Kalampaka Forest	~ 2.500 (32 fs)	= 2.087,70	41 fs in total: Dimotiko Kastanias 7 fs (11α, 11β, 12α, 12β, 13, 14, 15) Dimosio Kastanias 5 fs (1γ, 1δ, 2α, 2β, 2γ) Aspropotamos 29 fs (59β, 59γ, 65α, 65β, 66α, 66β, 66γ, 68γ, 69α, 69β, 69γ, 73ε, 74α, 75γ, 76α, 76δ, 77α, 77δ, 83α, 83β, 83γ, 84α, 84β, 84γ, 86α, 86β, 88α, 88β, 94α)
National Park of Parnitha	~ 4.000	= 16.323,93	11fs: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11
Mount Taygetos	~ 8.000 (44 fs)	= 13.055,30	55 fs: (2, 3, 4, 5, 6, 7, 8α, 8β, 8γ, 10α, 10β, 10γ, 11α, 11β, 11γ, 12α, 14α, 14β, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37, 38, 41, 42, 43α, 43β, 44, 45α, 45β, 49α, 49β, 50α, 50β, 51α, 51β, 52α, 54α, 54β, 55α, 55β)
TOTAL	~16.000	= 32.889,13	128