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1 Appendix A – Forest management alternatives

2 For this analysis, a maximum of 58 forest management alternatives for each forest stand were 3 considered. The actual number of alternatives applied on each stand varied, and this was 4 dependent on the initial stand characteristics. Generally we followed the management 5 alternatives of the "best practices guide" for forest management in Finland (Äijälä et al. 2014). 6 Of the 58 management alternatives, 17 of these were variations on rotation forest management 7 (RF), where clear felling followed by planting is a key feature of these management alternatives. 8 The majority (40) of the management alternatives generated were variations on the continuous 9 cover forest management (CCF), where the primary harvesting is to selectively cut the largest 10 trees from the forest and allow ingrowth to regenerate the forest stand. We allowed four 11 variations on the target basal area to determine when selective harvesting was to occur, and we 12 delayed the starting to conduct selective harvesting by up to 45 years. In addition, we allowed an 13 alternative where no management actions would be taken in the forest (set aside). The 14 abbreviations of the management alternatives are listed in table S1.

15 The forest management actions for the RF management alternatives were structured 16 through decision rules for when to harvest, thin or perform other silvicultural actions (Äijälä et 17 al. 2014). The decision rules were based on the site type, the height of the dominant tree species 18 and the age of the stand. The timing of the final felling depended on reaching a specific dominant 19 height (greater than 16 or 14 m high), and an age greater than a specific threshold (70 or 90 20 years). A structure of silvicultural activities to promote regeneration are taken, such as site 21 preparation followed by artificial regeneration. To generate a range of management alternatives, 22 variations on the decision rules are made; aimed to shorten and lengthen the rotation length, and

1

various alternatives to promote ecological values (limiting thinning or increasing retention trees
following clearfelling).

In a similar fashion, the CCF management alternatives were generated through a structured decision tree. The harvesting actions in all CCF management alternatives are based on thinning from above, and promotion of natural regeneration to restock the stand. The decision to conduct thinnings were based on the stand basal area, with a specific threshold dependent on the productivity of the site. To generate a variety of CCF management alternatives, we adjusted the basal area threshold, and we delayed the initial implementation of CCF by up to 45 years, with delays of 5-year increments.

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11 References:

Äijälä, O., Koistinen, A., Sved, J., Vanhatalo, K., & Väisänen, P. (2014). Hyvän metsänhoidon
suositukset [Good forest management recommendations]. *Forestry Development Center Tapio [In Finnish]*

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Abbreviation	Title	Actions	Timing
SA	Set aside	No management	-
		Thinning from above, with 4	
CCF_0	Continuous cover forestry	predefined harvesting thresholds	No Delay
CCF_5	-"-	-"-	5 year delay
CCF_10	-"-	-"-	10 year delay
CCF_15	-"-	-"-	15 year delay
CCF_20	-"-	-"-	20 year delay
CCF_25	-"-	-"-	25 year delay
CCF_30	-"-	-"-	30 year delay
CCF_35	-"-	-"-	35 year delay
CCF_40	-"-	_"_	40 year delay
CCF_45	-"-	_"_	45 year delay
		Clear felling, no thinnings prior to	
SR5	Short rotation harvesting	clearfelling	5 years early
ТН	Rotation harvesting	-"-	No Delay
LRH5	Long rotation harvesting	-"-	5 year delay
LRH10	Long rotation harvesting	-"-	10 year delay
LRH15	Long rotation harvesting	-"-	15 year delay
LRH30	Long rotation harvesting	-"-	30 year delay
SRT5	Short rotation thinning	Thinning followed by clear felling	5 years early
TT		-"-	No Delay
LRT5	Long rotation thinning	-"-	5 year delay
LRT10	Long rotation thinning	-"-	10 year delay
LRT15	Long rotation thinning	-"-	15 year delay
LRT30	Long rotation thinning	-"-	30 year delay
	Harvesting without	Clear felling, no thinnings prior or after	
THwoT	thinnings	clearfelling	No Delay
	Harvesting without		
THwoT10	thinnings	-"-	10 year delay
	Harvesting without		
THwoTM20	thinnings		20 years early
	Nature focused rotation	Same as 1H, 30 retention trees per ha	Na Dalau
THN2	Nature feeling	leit	по рејау
	thinning	Same as 11, 30 recention trees per ha	No Dolay
I I IN	ummig	leit	NO Delay

3 Table S1. Description of management alternitives.