Table 1. Potential pathways to achieving the mitigation outcomes outlined in the RFA: 15% increase in C sequestration and 10% reduction in N and energy use by 2030, relative to 2010 baselines.

Management Alteration	**Scenario assumptions**	**Potential Stand-Level Impact due to Management Change**	**Potential adoption by 2030**		**Total potential mitigation outcome across all planted pine by 2030**
			Industrial	**NIPF**	
Increase rotation age from pulpwood to solid wood regime on existing and new plantations	Stand-level impact from Gonzalez-Benecke *et al.* 2010; largest impacts likely in sub-regions with greater focus on pulpwood, *e.g.* Florida, NC/SC/GA coastal plain	20% increase in *in situ* + *ex situ* C stocks	4 million ac	700,000 ac	38 million Mg C, 2.4% increase in C sequestration
Increased acreage fertilized due to lower fertilizer cost associated with improved N efficiency fertilizers	Decreased fertilizer cost due to improved fertilizer N efficiency plus outreach efforts will spur fertilization of additional acres; average increase in *in situ* + *ex situ* C stocks due to fertilization ~ 15% (Gonzalez-Benecke *et al.* 2010)	15% increase in *in situ* + *ex situ* C stocks	10 million ac	500,000 ac	63 million Mg C, 4% increase in C sequestration
Substitution of wood for more C emission-intensive building materials, based on more solidwood production from increased rotation age and fertilizer scenarios above	~ 4 times forest C pool, Perez-Garcia *et al.* (2005); assume that 25% of increased solid wood production ends up being used as a substitute for steel or concrete	160 Mg C / ac	--	--	188 million Mg C, reductions in emissions equivalent to 12% increase in C sequestration
Deployment of genetically improved seedlings on reforested plantations	Reforested plantations will use seedlings with improved genetics relative to what was harvested; assume 10% productivity gain per tree breeding generation (McKeand *et al.* 2006)	4 Mg C / ac	10 million ac	1 million ac	44 million Mg C, 2.8% increase in C sequestration
Silvicultural treatments and seedling genetic deployment that increase resilience to catastrophic disturbances	Assume avg. of half of C stocks lost to catastrophic disturbance; sub-regions with largest impacts will depend on disturbance	20 Mg C / ac	2 million ac	1 million ac	60 million Mg C, 3.8% increase in sequestration
Use of enhanced efficiency N fertilizer to reduce amount of N applied per acre	Reduce volatilization losses by 25% (Zerpa and Fox 2010) & improve N uptake efficiency by 25% compared with urea (Blazier et al. 2006); 1 million ac/yr fertilized on industrial (Albaugh *et al.* 2007); 100,000 ac/yr fertilized on NIPF; assume 100 lb/ac enhanced fert N applied	50% reduction in N fertilizer application	50% of fertilized acres / 500,000 ac/yr	50% of fertilized acres / 50,000 ac/yr	Reduction of N application by 27,500 tons N / year = 25% reduction in applied N
Use of enhanced efficiency N fertilizer to reduce C cost associated with N fertilizer manufacture	manufacturing of urea = 3.127 kg CO_2 eq. kg^{-1} N and 0.0208 kg CO_2 eq. kg^{-1} (Nemecek and Kägi 2007)	--	--	--	180,000 Mg C reduction in emissions from N fert manufacture, equivalent to a marginal % increase in sequestration
Afforestation of marginal agricultural land	Improved profitability of forest operations resulting from this project will encourage some portion of NIPF or farmers to convert marginal ag. land to forest; Assume negligible C stocks on ag land, average stand-level forest C stocks from Gonzalez-Benecke *et al.* 2010	40 Mg C / ac	NA	1 million ac	40 million Mg C, ~ 2.5% increase in sequestration
Avoided conversion of forestland to non-forest use	Improved profitability of forest operations resulting from this project will enable some portion of acreage to remain in forestland that would have been converted; Avg. forest C stocks from Gonzalez *et al.* 2010	40 Mg C / ac	1 million ac	1 million ac	80 million Mg C, ~ 5% increase in sequestration