

Appendix B. Management Strategies workbook

Ecological System	Management Action Name in Model	Management Action Description	From Class	To Class	Cost/ Acre	Model Notes	Management Comments
Cove Forest	Gap Harvest + Thinning	Harvest ranging from 2 to 40 acres in size, and thinning between gaps, to create gaps and more open forest	B- Mid-Closed (age 80-99)	C- Late Open (80%) and A (20%)	\$60 (commercial); \$250 (non-comm)		Typical harvest constitutes 1/5 to 1/3 of stand; repeated on different % in 10-30 years, depending upon monitoring. Less than 30 basal area for gaps; thinning is 40 and above
Cove Forest	Regen Harvest	Shelterwood harvest of majority of overstory	D- Late-Closed	A- Early	\$50 (commercial); \$150 (non-comm)		Typically 10-40 acres in size.
Cove Forest	Harvest - Restore + Plant	Restoration harvest with planting - remove entire overstory of uncharacteristic white pine; plant hardwood seedlings	WP- White Pine	A- Early	\$210 (commercial); \$310 (non-comm)	60% success rate	Assumes two years of follow-up herbicide treatments. Planting only @ \$100/acre; w herb @ \$160/acre. Dependent upon infrequent favorable market conditions to be commercially viable.
Cove Forest	n/a	Heavy thinning of tulip poplar to promote other species and create more diverse forest					Stand improvement strategy not incorporated into models
Cove Forest	n/a	Treat individual hemlock trees to prevent or reduce mortality and allow future seed dispersal					Individual species strategy not incorporated into models

Dry Oak	RxFire	Prescribed fire to increase and maintain open classes	All classes but A	Open and A-Early	\$50	In Closed classes 33% converts to Open, 8% converts to A, and 59% remains Closed; in Open classes 3% to A and 97% stays Open; A remains A	Assumes ~1000 block burn including mosaic of systems. Actual outcomes variable; depends upon prescription and if prescription goals are met
Dry Oak	RxFire - Maintenance	Prescribed fire to maintain open classes	All Open (C,D,F)	Remains in class	\$50		Used x years after other management treatments to maintain open classes
Dry Oak	Regen Harvest	Shelterwood harvest of majority of overstory	E- Late-Closed	A- Early	\$50 (commercial); \$150 (non-comm)		Typically 20-40 acres in size. Assumes continued fire.
Dry Oak	Woodland Restoration	Partial harvest/heavy thinning to create more open oak woodland	E- Late-Closed	D- Late Open	\$50 (commercial); \$150 (non-comm) - assume 50-50 ratio	80% success	needs fire to maintain
Dry Oak	RxFire-WP/YP	Prescribed burns to restore oak woodland in Uncharacteristic White Pine and Yellow Polar where partial oak seed source present	WP- White Pine, YP- Yellow Poplar	D- Late Open	\$ 50	80% success	
Dry Oak	Harvest - Restore	Restoration harvest - remove partial overstory of uncharacteristic white pine, yellow poplar or yellow pine stands; no oak overstory or planting	WP- White Pine, YP- Yellow Poplar, PD- Pine Dominated	A- Early, C-Mid Open, D-Late Open	\$50 (commercial); \$150 (non-comm)	20% success rate when oaks are not left	Success rate dependent upon continued fire. Simon estimates more than 75% of the U-classes are in this category (no oaks)

Dry Oak	Harvest- Restore- OakOverstory	Restoration harvest - remove partial overstory of uncharacteristic white pine, yellow poplar or yellow pine stands; no "oak planting"; leave some mature oak overstory	WP- White Pine, YP- Yellow Poplar, PD- Pine Dominated	C-Mid Open, D-Late Open	\$50 (commercial); \$150 (non-comm)	80% success rate when oak trees left	Success rate dependent upon continued fire. Simon estimates ~40% of the U-classes are in this category.
Dry Oak	Harvest - Restore + Plant	Restoration harvest with planting - remove entire overstory of uncharacteristic white pine, yellow poplar or yellow pine stands; plant oak seedlings	WP- White Pine, YP- Yellow Poplar, PD- Pine Dominated	A- Early	\$210 (commercial); \$310 (non-comm)	60% success rate	Assumes two years of follow-up herbicide treatments. Planting only @ \$100/acre; w herb @ \$160/acre. Success rate dependent upon continued fire
Dry-Mesic Oak	RxFire	Prescribed fire to increase and maintain open classes	All classes but A	Open and A- Early	\$50	In Closed classes 33% converts to Open, 8% converts to A, and 59% remains Closed; in Open classes 3% to A and 97% stays Open; A remains A	Assumes ~1000 block burn including mosaic of systems. Actual outcomes variable; depends upon prescription and if prescription goals are met
Dry-Mesic Oak	RxFire - Maintenance	Prescribed fire to maintain open classes	All Open (C,D,F)	Remains in class	\$50		Used x years after other management treatments to maintain open classes
Dry-Mesic Oak	Thinning	Commercial or non- commercial mechanical thinning to create gaps and more open forest (remove ~20% of BA)	E- Late- Closed	D- Late Open	\$50 (commercial)\$150 (non-comm)		Needs continued fire to maintain at D. This is 'low-hanging fruit' and gets lower the closer it is to roads and on slopes < 30% slope (tractor logging); commercial requires at least 2500 board feet
Dry-Mesic Oak	Regen Harvest	Shelterwood harvest of majority of overstory, following pre-harvest guidelines from "Loftis publications"	E- Late- Closed	A- Early	\$50 (commercial)\$150 (non-comm)		Vaible for medium to large loggers. Typically 10-40 acres in size. Assumes continued fire.

Dry-Mesic Oak	Harvest - Restore	Restoration harvest - remove partial overstory of uncharacteristic white pine or yellow pine stands; no oak overstory or planting	WP- White Pine, PD- Pine Dominated	A- Early, C-Mid Open, D-Late Open	\$50 (commercial); \$150 (non-comm)	20% success rate when oaks are not left	Success rate dependent upon continued fire. Simon estimates more than 75% of the U-classes are in this category (no oaks)
Dry-Mesic Oak	Harvest- Restore- Oak Overstory	Restoration harvest - remove partial overstory of uncharacteristic white pine or yellow pine stands; no "oak planting"; leave some mature oak overstory	WP- White Pine, PD- Pine Dominated	C-Mid Open, D-Late Open	\$50 (commercial); \$150 (non-comm)	80% success rate when oak trees left	Success rate dependent upon continued fire. Simon estimates less than 25% of the U-classes are in this category.
Dry-Mesic Oak	Harvest - Restore + Plant	Restoration harvest with planting - remove entire overstory of uncharacteristic white pine or yellow pine stands; plant oak seedlings	WP- White Pine, PD- Pine Dominated	A- Early	\$210 (commercial); \$310 (non-comm)	60% success rate	Assumes two years of follow-up herbicide treatments. Planting only @ \$100/acre; w herb @ \$160/acre. Success rate dependent upon continued fire
Low-Elevation Pine	RxFire	Prescribed fire to increase open & early succession classes	All classes but A	Open and A- Early	\$50	In Closed classes 20% to open and 80% to A; in Open classes 10% to A and 90% stays Open; A remains A	80% conversion to A based on current conditions with beetles; would be lower in future. Assumes ~1000 block burn including mosaic of systems. Actual outcomes variable; depends upon prescription and if prescription goals are met
Low-Elevation Pine	RxFire - Maintenance	Prescribed fire to maintain open classes	All Open (C,D)	Remains in class	\$50		Used x years after other management treatments to maintain open classes
Low-Elevation Pine	Restoration Treatment	Eradicate uncharacteristic oak stands without re-planting; pine seed source present	OD- Oak Dominated	A- Early	\$200	80% success rate	Non-commercial. Management treatment would be targeted to areas with seed source; estimated 50% of OD has seed source. Success rate dependent upon continued fire
Low-Elevation Pine	Restoration Treatment-No Seed Source	Eradicate uncharacteristic oak stands without re-planting; no pine seed source present	OD- Oak Dominated	A- Early	\$200	10% success rate	Non-commercial -- estimated 50% of OD acres does not have seed source. Success rate dependent upon continued fire

Low-Elevation Pine	Restoration Treatment + Planting	Eradicate uncharacteristic oak stands with pine re-planting	OD- Oak Dominated	A- Early	\$300	85% success rate	Non-commercial. Success rate dependent upon continued fire
Low-Elevation Pine	Woodland Restoration	Harvest commercial hardwood and allow pine regeneration	OD- Oak Dominated	D-Late Open	\$50	80% success	Dependent on having a seed source like eradication treatment above
Low-Elevation Pine	Thinning	Thinning of late-closed class to create more open canopy	E- Late Closed	Late-Open	\$600		Non commercial.
Low-Elevation Pine	FireBreak	Clear 3 to 20 foot fire line and plant with native seed (grass) in urban interface area	All	A	\$1,200		Cost is average \$3000 per mile including seed, includes greater cost for areas with slopes and requirement for wider breaks. Figuring 2.5 acres per mile
Low-Elevation Pine	n/a	Maintain white pine stands in commercial plantation management					Not able to model this; address in text if any recommendations
Montane Pine	RxFire	Prescribed fire to increase open & early succession classes	All classes but A	Open and A- Early	\$50	In Mid-Closed 20% to open and 80% to A; in Late-Closed 80% to Open and 20% to A; in Open classes 10% to A and 90% stays Open; A remains A	80% conversion to A based on current conditions with beetles; may be lower in future. Assumes ~1000 block burn including mosaic of systems. Actual outcomes variable; depends upon prescription and if prescription goals are met
Montane Pine	RxFire - Maintenance	Prescribed fire to maintain open classes	All Open (C,D)	Remains in class	\$50		Used x years after other management treatments to maintain open classes
Montane Pine	Restoration Treatment	Eradicate uncharacteristic oak stands without re-planting; pine seed source present	OD- Oak Dominated	A- Early	\$200	80% success rate	Non-commercial. Management treatment would be targeted to areas with seed source; estimated 30% of OD has seed source. Success rate dependent upon continued fire
Montane Pine	Restoration Treatment-No Seed Source	Eradicate uncharacteristic oak stands without re-planting; no pine seed source present	OD- Oak Dominated	A- Early	\$200	10% success rate	Non-commercial -- estimated 70% of OD acres does not have seed source. Success rate dependent upon continued fire

Montane Pine	Restoration Treatment + Planting	Eradicate uncharacteristic oak stands with pine re-planting	OD- Oak Dominated	A- Early	\$300	85% success rate	Non-commercial. Success rate dependent upon continued fire
Montane Pine	Thin-B	Thin mid-closed class to create more open canopy	B- Mid Closed	C- Mid Open	\$90		
Montane Pine	RxFire-Oak	prescribed burns where partial pine seed source present	OD- Oak Dominated	A- Early	\$50	80% success rate	Non-commercial - targeted to areas with seed source; estimated 30% of OD has seed source.
Montane Pine	Thinning	Thinning of late-closed class to create more open canopy	E- Late Closed	D- Late Open	\$600		Non commercial.
Montane Red-Chestnut Oak	RxFire	Prescribed fire to increase and maintain open classes	All classes but A	Open and A- Early	\$50	In Closed classes 33% converts to Open, 8% converts to A, and 59% remains Closed; in Open classes 3% to A and 97% stays Open; A remains A	Assumes ~1000 block burn including mosaic of systems. Actual outcomes variable; depends upon prescription and if prescription goals are met
Montane Red-Chestnut Oak	RxFire - Maintenance	Prescribed fire to maintain open classes	All Open (C,D,F)	Remains in class	\$50		Used x years after other management treatments to maintain open classes
Montane Red-Chestnut Oak	Thinning	Commercial or non-commercial mechanical thinning to create gaps and more open forest (remove ~20% of BA)	E- Late Closed and B- Mid Closed	D- Late Open and C- Mid Open	\$50 (commercial); \$150 (non-comm)	Thinning in Class B suitable for older age stands, so applied to 25% of this class	Needs continued fire to maintain open. This is 'low-hanging fruit' and gets lower the closer it is to roads and on slopes < 30% slope (tractor logging); commercial requires at least 2500 board feet
Montane Red-Chestnut Oak	Gap Harvest + Thinning	Group selection harvest <1 to 2 acres in size and thinning between gaps, to create gaps and more open forest	E- Late-Closed	D- Late Open	\$60 (commercial); \$250 (non-comm)		Only viable for small loggers. Typical harvest constitutes 1/5 to 1/3 of stand; repeated on different % in 10-30 years, depending upon monitoring. These conditions assume fire at the

							suggested intervals from the BpS models.
Montane Red-Chestnut Oak	Regen Harvest	Shelterwood harvest of majority of overstory, following pre-harvest guidelines from "Loftis publications"	E- Late-Closed	A- Early	\$50 (commercial); \$150 (non-comm)		Vaible for medium to large loggers. Typically 10-40 acres in size. Assumes continued fire.
Montane Red-Chestnut Oak	Harvest - Restore	Restoration harvest - remove partial overstory of uncharacteristic white pine, yellow poplar or yellow pine stands; no oak overstory or planting	WP- White Pine, YP- Yellow Poplar, PD- Pine Dominated	A- Early, C-Mid Open, D-Late Open	\$50 (commercial); \$150 (non-comm)	20% success rate when oaks are not left	Success rate dependent upon continued fire. Simon estimates more than 75% of the U-classes are in this category (no oaks)
Montane Red-Chestnut Oak	Harvest- Restore- OakOverstory	Restoration harvest - remove partial overstory of uncharacteristic white pine, yellow poplar or yellow pine stands; no "oak planting"; leave some mature oak overstory	WP- White Pine, YP- Yellow Poplar, PD- Pine Dominated	C-Mid Open, D-Late Open	\$50 (commercial); \$150 (non-comm)	80% success rate when oak trees left	Success rate dependent upon continued fire. Simon estimates less than 25% of the U-classes are in this category.
Montane Red-Chestnut Oak	Harvest - Restore + Plant	Restoration harvest with planting - remove entire overstory of uncharacteristic white pine, yellow poplar or yellow pine stands; plant oak seedlings	WP- White Pine, YP- Yellow Poplar, PD- Pine Dominated	A- Early	\$210 (commercial); \$310 (non-comm)	60% success rate	Assumes two years of follow-up herbicide treatments. Planting only @ \$100/acre; w herb @ \$160/acre. Success rate dependent upon continued fire
Riparian	RxFire- Carryover	Carryover of prescribed fire from other systems	All	Varies -- see note	\$50	In Open classes 90% remains open and 10% goes to Early; in Closed classes 10% to Open, 0% to A, and 90% remains Closed	Approximately 0.5% of total combined fire across a given scenario (e.g. 25 acres out of 5,000 acres burned) is assumed to carryover into the embedded riparian system, which is about 0.5% of the landscape.

Riparian	n/a	Treat individual hemlock trees to prevent or reduce mortality and allow future seed dispersal					Individual species strategy not incorporated into models
Riparian	n/a	Weed treatment					Individual species strategy not incorporated into models
Riparian	n/a	River cane restoration					Individual species strategy not incorporated into models
Spruce-Fir	Spruce-Restoration	Speed transition back to mature spruce overstory with underplanting and/or thinning	U- No Spruce	D- Late Closed	\$300	80% success rate	New strategy added per re-classification of the Uncharacteristic-no spruce class (if no spruce in canopy after 90 yrs)