ATTACHMENT 5: CLIMATE CHANGE CONSIDERATIONS

Table 5-1. Local Considerations and Adaption Actions Applied to Proposed Actions in the Hi Lo Project Area

Area of Interest	Goals and Objectives	Challenges and Vulnerabilities within the Hi Lo Project Area	Adaptation Actions Applied to the Proposed Action
Red Pine	Improve growing conditions for remaining trees in red pine stands.	Red pine are moderately susceptible to drought stress, especially on the thinner, dry soils which covers approximately 60% of the project area; however, conditions are not ideal. Slightly deeper soils (ELT 16), which provides more moisture and better growing conditions for red pine, could be more susceptible to drought stress as they are accustomed to more moisture. Densely stocked stands may have health problems and are more vulnerable to pests, disease, and other stressors, especially when combined with droughty conditions. Access and operability in the Hi Lo area is difficult due to terrain, rocks, shallow soils, and wet soils (winter access routes - projections indicate these areas could be frozen for shorter durations in winter or not at all.)	Use conventional and variable density thinning to reduce moisture and nutrient competition; while retaining diversity species such as oak and white pine. Locate gaps near potential seed sources when doing variable density thinning. Underplant or interplant to increase diversity after thinning, especially in areas that are predominantly red pine. Look into using seed stock from seed zone 1 (Chippewa NF and further west and south). Plant red pine in old aspen stands that might be planted with jack pine or white pine. Retain oak in red pine stands and intentionally regenerate some of the hardwood species in red pine stands. Create snags, where few or none already exist, for biological legacy areas. Use prescribed fire after a conventional thinning to control balsam fir and brush.

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Fire Risk and Fuel Loading	Reintroduce fire as a natural disturbance process. Reduce potential impacts of an uncharacteristic wildfire, especially in the WUI. Manage fire and vegetation especially along the wilderness boundaries. Increase the complexity of disturbance effects.	Dry soils, more drought, and more stress to vegetation increases mortality potential which could increase the intensity of wildfires.	Increasing the use of prescribed burns would benefit oak, jack pine, white pine, and red pine. Using natural boundaries, such as lakes, rivers, roads, would make conducting prescribed burns easier to manage, typically requiring fewer people and less money. Prioritize the use of prescribed fire to those places where species would benefit most and utilize mechanical treatments in other areas. Use fire when access is difficult and mechanical or harvesting is not an option. Use fire at a large scale across the landscape to increase the complexity of vegetation and wildfire.
		The Hi Lo Project is in a high priority WUI area, with many recreation opportunities and forest users.	
		Lack of management and low intensity, frequent wildfires, combined with mixed ownership in the southern third of the project areas has created areas where a wildfire could be very difficult to suppress and manage.	
		There is a high volume of balsam fir across the project area and recently the area has begun to see a rise in spruce bud worm kill.	
		The project is surrounded by wilderness on three sides increasing the potential for a wildfire to escape and enter the WUI area.	
		There are a limited number of opportunities, dollars, and staff to accomplish many prescribed burns.	

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Oak and Blueberry	Improve and restore these areas as mast-producing habitats and foraging areas.	These types tend to be on the shallow dry sites, which could get too dry to support oak with future predicted conditions. Non-native plants are a high risk in these areas. Prescribed fire opportunities could be small given the dry nature of the site and conditions could get too dry to safely burn. Some oak and blueberry areas are getting smaller and choked out due to competing vegetation. These areas are more conducive to creating habitat as opposed to growing large trees.	Expand the extent of these cover types where and when feasible with fire and hand cutting. Oaks would be retained for diversity across the project area. Increasing oak habitat could be accomplished using hand tools, although both oak and blueberry benefits from prescribed fire. These areas could be burned in early spring as they tend to dry out more quickly. Look for opportunities to expand or plant oaks in the deeper soils such as ELT 16.
White Pine (WP)	Increase presence on deeper soils. Increase as a diversity component in other forest types. Increase vigor when present in mixed stands.	Within the project area WP is most often found on poor, shallow sites that could be more susceptible to drought. WP is more vulnerable here than other pines. Extreme wildfires may be more damaging to WP than other pines; however, more frequent, less intense fires would be beneficial.	Attempt to establish WP on deeper soils (ELT 16, 17) by planting as it may become more favorable because of less competition. Promote multi-age stands to increase residual tree vigor by thinning and planting. Plant mixed long-live conifer (including white pine) in overmature aspen stands.

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Aspen and Jack Pine	Regenerate these stands aged 40 years or older. Increase species diversity. Increase structural diversity by retaining large clumps from 5-20% of the stand.	Aspen is more susceptible to drought than jack pine.	Convert off-site aspen with a clearcut and planting or seeding to jack pine. In stands where there is ELTs 11, 16, 17, 18, use prescribed fire as site preparation to facilitate where feasible. Promote big tooth aspen over quaking aspen where possible. Interplant species, such as white spruce and white pine, to improve diversity. In overmature aspen, leave clumps of older aspen to deteriorate and succeed naturally to conifer; underplant with a variety of species to increase diversity.
		Mountain pine beetle could become an issue in the future for jack pine	
		More risk to aspen from succession and old age than climate change right now.	
		Big tooth aspen is present in the project area and projected to do better than quaking aspen.	
		More stress on planted seedlings with warmer conditions and variable precipitation.	
		More frequent red maple encroachments changes the disturbance regimes.	