FORESTED VEGETATION		
Type of strategy	**General adaptation approach**	**Specific adaptation action**
Enhance Resistance (or Reduce Non-Climate Stresses)	forests by restoring forests at lower elevations, thus reducing spread of large crown fires	Thin dry forests to densities low enough to reduce fire intensity and spread
		Create targeted fuel breaks at strategic landscape locations
	Prevent invasive plants from establishing after disturbances	Include invasive species prevention strategies in all projects
		Inventory regularly to detect new populations and species
	Reduce dominance of root disease sensitive species on root disease-prone sites	Regenerate and plant with species less susceptible to root disease
		Thin out root disease susceptible species where less root disease susceptible species are abundant
		Implement hot prescribed burn with reburn
	Manage forest vegetation, and reduce fire severity and patch size	Use skips/gaps in silvicultural prescriptions
		Thin and plant disturbance-resilient species
		Promote disturbance-resilient species with fire (prescribed or natural)
		Thin and implement prescribed burns to reduce hazardous fuels in the wildland-urban interface
		Push boundaries of prescribed burning (e.g., burn earlier in the spring)
		Create gaps in forests to reduce competition and increase western larch vigor
		Protect high value trees (plus trees, cone producers, rare species, etc.) via management actions such as pheromones, seed orchards, etc.
	Reduce non-natives and/or increase exotic species control efforts	Decrease resilience of existing non-native species with appropriate management practices or biotic path herbicides
		Monitor soil stability and productivity to reduce low-fertility soils that promote non-natives

		Implement early detection/rapid response for exotic species treatment
	Prevent widespread outbreaks of invasive species or pathogens	Plan for extreme events and events with low probability
		Treat existing pathogen outbreaks with more aggressive management
		Promote weed-free seed and ensure weed-free policies are included in planning documents
		Expand weed-free feed list to include additional non-native species
		Prevent non-native plant introductions during projects
		Reduce grazing practices that encourage the spread of non-native species
		Maintain permits for aggressive treatment of invasive species (e.g., burning, herbicide)
	Prevent the development of and reduce risks associated with hazard trees	Develop options, triggers, and methods for more aggressive management of hazard trees
		Enhance internal education about increasing hazard tree risk
	Reduce impacts of disease and fire	Strategically use anti-aggregation pheromones
		Consider increasing use of pheromone treatments to protect trees in campgrounds, high value habitats, and after floods
		Identify critical stands for direct protections from fire and insects
		Create buffer zones between fire and residential development
		Influence development zoning in high fire risk areas
		Increase forest diversity (e.g., species composition, age class, structure) and manage for stand heterogeneity (consider focusing on interface jurisdictions such as low elevations)
		In dry forest, restore low-severity fire and early-successional species
		Incorporate climate change into Wildland Fire Decision Support System
		Enhance education and communication about responsible land owner actions in WUI
		Thin to accelerate development of late-successional forest conditions

	Increase resilience of forest stands to disturbances and future conditions	Thin to limit dominance of moisture-dependent species on drought-prone sites
		Thin older forests to support regeneration
		Thin to promote shade-tolerant species
		Consider using more prescribed fire where scientific evidence supports change to more frequent fire regime
		Maintain soil productivity through appropriate silvicultural practices
		Consider including larger openings in thinning prescriptions and planting seedlings in the openings to create seed sources for native drought-tolerant species
		Manage species densities to maintain tree vigor and growth potential
		Maximize early successional tree species diversity by retaining minor species during pre-commercial thinning activities to promote greater resilience to drier conditions
		Increase the amount of thinning and/or alter thinning prescriptions
		Use girdling, falling and leaving trees, prescribed burns, and wildland fire to reduce stand densities and drought stress
		Increase flexibility in fire management
		Harvest to variable densities
	Increase forest landscape resilience to large and extensive insect or pathogen outbreaks	Design forest gaps that create establishment opportunities
		Plant blister rust-resistant trees and/or prune blister rust
		Implement prescribed burning in areas affected by insect outbreaks
		Plant resistant species or genotypes where species-specific insect or pathogen outbreaks are a concern
		Increase diversity of patch sizes
		Consider climate change in post-fire rehabilitation
		Develop rapid response/assessment for fire restoration
		Determine where native seed may be needed for post-fire planting
		Manage forest restoration for future range of variability

Promote Resilience	Increase resilience through post-fire or post-flood management	Allow some burned areas to regenerate naturally
		Reduce density of post-disturbance artificial regeneration
		Consider planting fire-tolerant tree species post-fire in areas with increasing fire frequency
		Increase post-fire monitoring
		Use post-fire timber harvest to prevent uncharacteristic reburns
		Experiment with planting native grass species to compete with cheatgrass post-fire
		Increase production of native plant materials for post-flooding plantings
		Anticipate greater need for seed sources and propagated plants
	Increase resilience by promoting native genotypes and adapted genotypes of native species	Plant potential microsites with a mix of potential species (bet-hedging)
		Plant seeds with biochar coating
		Use seeding of native plant species in areas with non-native species
		Increase the availability of nursery stock and seed for tree species in cold upland and subalpine forests
		Utilize seed collection and seed banks for wildfire restoration and planting
		Interplant to supplement natural regeneration and genetic diversity
		Identify areas important for in situ gene conservation
		Maintain a tree seed inventory with high-quality seed for a range of species, particularly species that may do well in the future under hotter, drier conditions
		Develop seed orchards that contain a broader range of tree species and genotypes than in the past
		Develop a gene conservation plan for ex situ collections for long-term storage
		Protect trees that exhibit adaptation to water stress (e.g., trees with low leaf area to sapwood ratio) and collect seed for future regeneration
		Consider using genetically improved seedling stock

	Emphasize use of plant species in restoration projects that will be robust to climate change
	Plant genetically adapted species from appropriate seed zones
Plan and prepare for increased fire frequency and severity and greater area burned	Incorporate climate change into fire management plans
	Plan post-fire response for large fires
	Consider using prescribed fire to facilitate transition to a new fire regime in dry forests
	Anticipate more opportunities to use wildfire for resource benefit
Employ a risk-diversification approach to forest management and silvicultural practices by spreading risks at the local and landscape level	Promote diverse age classes, species mixes, within stand and across landscape structural diversity and genetic diversity and minimize monocultures
	Utilize interplanting to supplement native regeneration/genetic diversity
	Maintain variability in species and tree architecture in certain locations
	Prepare for species migration by managing for multiple species across large landscapes
	Allow stands to develop somewhat idiosyncratically within a spacious envelope of possible conditions
Maintain or increase the extent of subalpine berry areas	Maintain huckleberry production through tree removal and prescribed fire
	Consult with tribes to understand historical patterns and current locations of huckleberry habitat
Restore and promote health and vigor of aspen clones	Implement ungulate management during regeneration and/or to protect existing populations
	Remove conifers
	Determine effect of disturbance frequency on aspen survival, and effects of Sudden Aspen Death and new clones
	Develop techniques for artificial regeneration of aspen
	Select for drought tolerant mother trees
	Identify and target areas most likely to successfully regenerate to be good planting opportunities

		Increase fire disturbance
Facilitate Transition	Facilitate change to desired assemblages	Plant seedlings expected to thrive in new climate conditions
		Foster resilience in areas shifting to novel assemblages
		Monitor for management action effectiveness and communicate effective techniques to partners and stakeholders
		Consider planting desired species (assisted migration) rather than relying on natural regeneration and migration
		Plant and encourage regeneration of rare and disjunct species in appropriate locations
		Prioritize monitoring and management of desired species where predicted to survive and establish in future
	Promote connected landscapes that can facilitate forest species migration along climatic gradients	Identify and protect wildlife corridors that can serve double duty as migration corridors for plant species
		Identify existing and historical conditions and develop desired conditions for species connectivity
	Identify and protect refugia and/or implement restoration actions in refugia	Identify sites that are less likely to be affected by climate change (refugia) and focus restoration activities on those sites
		Identify processes and conditions that create fire refugia, and map refugia areas
		Identify critical stands for direct protections from fire and insects
	Replace plant associations-habitat typing with index based on biophysical variables	Identify biophysical predictors related to habitat types, site productivity, vegetation composition and structure
		Predict site productivity based on biophysical predictors; use to determine what to plant now and long-term effects
		Project into the future based on climate change models
		Expand long-term monitoring programs, including reforestation monitoring and post-treatment monitoring. Track regeneration success and species distribution at the fine scale. Look for species transfer zones. Consider monitoring soil types as habitat types may not be appropriate with changing climate.

Increase Knowledge	Increase knowledge of patterns, characteristics, and rates of change in species distributions	Improve integration between wildlife managers and forest ecologists, and between research and management
		Install GLORIA plots to monitor species distribution and abundance
		Install and analyze additional plots to gather trend information over time, targeting areas where changes are expected
		Promote awareness of the important components within conservation areas (e.g., RNAs, roadless wilderness) and desired conditions
		Use FIA plot information to determine trends in subalpine forests
		Improve understanding of how stand mosaic influences connectivity for wildlife
	Increase knowledge of rates and patterns of tree establishment and regeneration failures	Detect and attribute historical changes in tree distribution at tree line
		Implement accurate mapping of important species
		Monitor tree establishment patterns
	Address information gaps in order to maintain viable populations	Address information gaps - identify current locations, potential habitat, and stand condition
		Address genetic data gaps - establish breeding program
Engage Coordination	Work across jurisdictions	Align budgets and priorities for program of work with neighboring lands
		Coordinate with USDA FS and NPS to create weed-free seed standards and regulations
		Communicate about adjacent projects and coordinate on-the-ground activities
		Coordinate USDA, USFS and NPS efforts to collect cones and produce seedlings
		Work across boundaries to preserve roads, trails, and access in light of increased fire and flood events
		Establish NF or regional monitoring network (i.e., intensified grid)

	Detect change (e.g., adult and seedling mortality, species composition)	Monitor establishment, survival, and development by age class across different aspects/heat load/soil moisture using FIA data and project-level stocking exam
		Expand reforestation and other monitoring, and continue to establish permanent monitoring plots and share data
		Coordinate invasive species management, funding, and support between agencies
		Collaborate with other federal agencies to monitor alpine species
		Monitor pre- and post-treatment