NON-FORESTED VEGETATION		
Type of strategy	**General adaptation approach**	**Specific adaptation action**
Enhance Resistance (or Reduce Non-Climate Stresses)	Maintain and/or increase resistance to invasives	Maintain adequate shrub cover, vigor, and species richness; avoid bare ground; and create variety of age classes
		Utilize tools such as removing timber products, implementing targeted grazing and prescribed burns, seeding, and mastication/slashing to decrease invasives
		Inventory weed free areas
		Reduce spread and introduction of invasive species to weed free communities and during projects
		Use seeding of native plant species in areas with non-native species
		Plant seeds with biochar coating
		Manage priority invasive species in priority areas
		Use targeted grazing to address vegetation management challenges (e.g., invasive weeds)
	Increase proactive management to prevent weeds	Apply early detection rapid response and inventory and mapping
		Implement integrated weed management; update weed risk assessment to enhance integrated weed management
		Develop weed management areas and coordinate with multiple agencies, NGOs, public, etc.
		Promote weed-free seed
		Expand weed-free feed list to include additional non-native species
		Ensure weed-free policies are included in planning documents
		Create and implement a management plan based on thresholds/triggers (prescribed burning, re-veg, thinning)
		Reduce grazing practices that encourage the spread of non-native species
		Identify and manage non-system/user created routes and implement appropriate travel management strategies
	Maintain populations of native species	Use fencing to protect native species from grazing by livestock and ungulates
		Manage hunting seasons to reduce impacts of grazing by ungulates
	Prevent widespread outbreaks of	Plan for extreme events and events with low probability

	Prevent widespread outbreaks of invasive species or pathogens	Maintain permits for aggressive treatment of invasive species (e.g., burning, herbicide)
	Prevent invasive plants from establishing after disturbances	Include invasive species prevention strategies in all projects
		Inventory regularly to detect new populations and species
Promote Resilience	Encourage native pollinators by providing habitat	Revegetate with native species as well as a diversity of species and distribution
		Promote appropriate herbicide and insecticide use
		Enhance public and agency education (e.g., regarding conflicts with honeybees, farm bill language)
	Maintain and/or increase resilience	Implement fuels reduction projects
		Develop a gene conservation plan for ex situ collections for long-term storage
		Maintain and increase seed inventory/bank with high-quality seed for a range of species, particularly species that may do well in the future under hotter, drier conditions
		Design burn prescriptions appropriate to desired shrub species
		Identify and promote early-successional natives that may be able to compete with non-natives
		Increase production of native plant materials for post-flooding plantings
		Implement habitat restoration and plant seed of native species
		Manage conifer encroachment
		Manage fire for resource benefits; allow natural and prescribed fire
		Utilize fire management techniques appropriate for specific species and during appropriate times (e.g., prescribed burning in spring)
		Manage livestock grazing by developing site-specific triggers for moving animals
		Promote the occurrence and growth of early-season native species
		Reduce grazing on native species in July and August to encourage perennial growth; focus grazing on non-native species in spring
		Revise grazing policies, and review and evaluate grazing allotment plans

		Evaluate grazing practices and determine and implement proper grazing; for example, identify locations where late-season grazing has minimal impacts
	Promote species and genetic diversity	Plant potential microsites with mix of species
		Interplant to supplement natural regeneration and genetic diversity
	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
	Manage for soil conditions to prevent increases in runoff	Ensure that vegetative ground cover is as high as possible for local conditions
	Identify potential resilience of different locations, and actively restore less resilient sites	Increase resilience of native species where intact or productive communities exist
		Implement a triage approach to soil moisture conditions (i.e. loess soil mapping for prioritizing areas)
		Decrease resilience of existing non-native species with appropriate management practices or biotic path herbicides
		Identify areas important for in situ gene conservation
		Monitor soil stability and productivity to reduce low-fertility soils that promote non-natives
	Maintain carbon on site to encourage moisture retention for grasslands	Apply biochar in grasslands to improve soil organic content
Facilitate Transition	Identify and protect refugia	Identify areas where relict plants could be established
		Designate conservation easements
	Increase knowledge of grasslands	Identify and map soil types (i.e., locate molisols) and prioritize for restoration; identify fire vs. snow-maintained sites
		Map risk areas for drought, monitor drought-prone areas, vegetate with frost and drought hardy genotypes

Increase Knowledge	Improve understanding of the effects of climatic variability and change on alpine plant species	Install plots to monitor species distribution and abundance
	Increase knowledge of patterns, characteristics, and rates of change in species distributions	Focus monitoring on sensitive locations such as wetlands and high elevations, on endemic or at-risk species, and on plant phenology
		Expand long-term monitoring programs, and conduct integrated and consistent inventory and monitoring of vegetation
	Increase knowledge of shrubland ecology	Improve education on ecology and disturbances affecting grasslands, effects of repeated burns, shifting mosaics, weed identification and reporting, importance of site potential in determining appropriate vegetation
		Educate following experts: fuels, forest ecologists, wildlife, silviculturalists
Engage Coordination	Work across jurisdictions	Coordinate invasive species management, funding, and support between agencies
		Coordinate with USDA FS and NPS to create weed-free seed standards and regulations
		Collaborate with other federal agencies to monitor alpine species
		Align budgets and priorities for program of work with neighboring lands
		Work across boundaries to preserve roads, trails, and access in light of increased fire and flood events
		Communicate about adjacent projects and coordinate on-the-ground activities