Assigned Goal	Objective	Potential Actions	Challenges	Possible solution	Supportive advancements, research, or tools	Options for advancing beyond "Business As Usual" approaches
Breakout Group 1 / **Maintain and restore giant sequoia groves, ecosystem integrity, diversity, and resilience**	Reforest areas that burned at high severity and are experiencing regeneration failure.	Refine climate informed prioritization (such as GTR 270); Collect material and grow seedlings; Implement fuels management for seedling survival; Create pre and post-reforestation stem maps	Limited capacity in reforestation pipeline, esp. related to planting; Lack clear guidance for prioritizing areas for reforesting sequoia specifically; No plan or dedicated resources for long-term seed collection and banking; Fuels reduction need to be part of the replanting treatment, but how/when to implement isn't well understood; Meeting regulatory requirements often results in missing the optimal planting window; There isn't a good Sequoia-specific model to help managers understand likely seedling success/failure	Plan for regeneration lack of success (have a plan to re-plant/second entry); Cone collection program/Reforestation pipline (i.e., the American Forests effort)	Quantitative genetics on giant sequoias to inform climate smart planting, such as the Adaptive Management Experiments (AMEX) occurring at Mountain Home demonstration state forest	Create a unified master plan that outlines needs, treatment approaches, and monitoring to increase opporuntity for adaptive management.
		Cultivate social license in media, science, and politics; Support the Giant Sequoia Lands Coalition and the concept of Learn (science/research work group) Rally (messaging and outreach) and Act (conservation/restoration, etc.)	Lack of messaging that conveys the true vulnerability of sequoias and their specific needs	Develop and fund a communications campaign that is transparent about the degree of uncertainty, risk, and science as a process.	GTR 270; explicit monitoring/experimental design site prep and planting experiment	Host a "matchmaking forum" to connect land management agencies with partners, and funding options with a goal of building more robust partnerships
	Experiment with strategic outplanting	Cultivate social license	Difficult to convey that this is an emergency situation and non-traditional tactics are needed; The scientific/management community has not done a good job of conveying the significant uncertainty involved in responding to climate change and that mistakes are inevitable.	Build a strong case for action by emphasizing the consequences of a no action alternative and support that message with avoided costs analyses.		Engage and connect geneticists with seed collectors and nursery experts from private, state, and federal e.g., LA Moran ,Placerville, SPI, etc.
		Conduct site evaluations and assessment of current conditions to identify appropriate areas for outplanting	Lack rigorous understanding of the conditions needed for sequoia success, so selecting best sites to experiment with planting outside of current range is difficult.	Hedge bets (use different models/approaches)	Need more information on planting mix; Need to quantify environmental conditions NOW in fire footprints; Need more information on fuel loading and management (when to burn, methods, how long to exclude fire); Need stem map	Speed up and streamline planning and compliance process - create a broad, large scale NEPA NEED to identify effective messaging to create social license for managers faced with difficult decisions; Increase opportunities for managing wildfire (rather than suppression).
Breakout Group 2 / **Create and sustain habitat for terrestrial wildlife in the short and long-term**	Maintain and protect areas that are currently supporting wildlife (e.g. unburned)	Balance disturbance regimes	Taxa will vary in their sensitivity to management-related disturbance	Map high priority biodiversity resources as priority areas to protect during wildfire events	Data on wildlife use of habitat patches; Decision support tools and optimization models like FEMS and others support working across large landscapes GTR 270 and emerging framework documents and analysis	Focus on which species are using the green landscape to guide biodiveristy?
		Prioritize action in areas of live/green forest that are at risk of future high severity fire	Fuel reduction activites can pose short-term risk because they cause further disturbance to wildlife; Prescribed burning is limited logistically due to feasibility (capacity + regulatory restrictions); Lack of knowledge/guidance/consensus on how to identify and prioritize areas most in need; Lack of knowledge/guidance/consensus on how to identify "do no harm" areas; Prioritization of where to treat can depend on ownerships	Spread disturbances from management out within a watershed over both space and time; Protect key habitat (e.g., denning centers or PACs) by implementing fuel reduction treatments outside of those areas to reduce the possibility of fire moving into and disturbing or modifying the key habitat; Increase capacity ($, workforce, regulatory, political appetite) for prescribed burning at times outside of spring reproductive period		
	Restore landscape functionality	Restore permeability (ability to move through boundaries) of landscape connectivity	Permeability and boundaries to movement are species-specific; Restoration may pose negative short-term impacts; Cross-jurisdictional planning is complex	Increase appreciation of snags as habitat that increases landscape permeability for many species; Increase appreciation of how shrubs can increase or decrease permeability; Protect and develop critical wildlife resources (e.g., snags, artifical covers, caves, and or denning boxes)	Identification of locations that are less climatically stressed and could be more resilient	Designate areas with potential for long-term resilience as "do no harm"
		Create heterogeneity in the landscape at multiple scales through reforestation	Existing models inform where regeneration is limited, not where and how to prioritize; There's a need to plan for vertical habitat too, which adds complexity; Cross-jurisdictional planning is complex	Identify seeps and microclimates refugial locations	Create a fire-risk database based on the value of the biodiversity resources associated with an area; Accurate post fire data at finer scales	Make preservation of green habitat a priority resource; Use of drones to collect better data on post-disturbance processes
Breakout Group 3 / **Maintain forests capable of persisting in concurrent and future climatic conditions**	Prioritize and act in areas that are more likely to persist based on ecological (hydrologic, climatic, etc.) processes	Develop a socio-ecological prioritization process analytical tool suited for the scale of the impacts and need; Establish a baseline for relevant ecological processes; Utilize and apply fire; Identify stands with unique genetic contributions and prioritize them for protection	Building support for and use of a tool; Deciding how to address scale during prioritization; The limited window of time to act before reburn; Accomodating different types of landowners and their priorities	Leverage participation from the private sector and or citizen science to improve input data; Protect green tree 'islands' as a place to do work and be anchor points for future fire mgmt. actions Provide incentives for and acquire access agreements via conservation easements	Better data are becoming available; Frameworks for prioritization are being developed; Continued research on impacts and opportunities; Ongoing research on climatic refugia for seed and cone collection; Land conseration initiaties and programs	Big picture restoration planning; Develop and promote incentives for protecting and establishing founder stands on private lands; BAR team for rapid assessment and response for restoration assessment and action; Thoughtful use of fire; Incentive programs for private landwoners to retain key areas and establish founder groves
		Use founder stands (from remnant green stands and established plantings) to facilate reforestation; Treat the perimeter surrounding remnant green areas and manage for resource benefit in fire	Providing protection may conflict w/restoration processes; Getting access to land; Not all green areas are of equal value/benefit - need a way to prioritize among those			
	Create capacity sufficient for maintaining and supporting the scale of the reforestation need and associated actions	Create an immediate/rapid reforestation response program; Invest in further refinement of seedlot selection tools; Cut red tape to more easily align project plans and streamline work	Analysis and permitting requirements for response; Concerns for negative environmental impacts from potential actions like herbicide application, salvage, or use of fire; Everyone wants to do "something" but not all actions may benefit restoration; Limited time to act before reburn	Build collaborative relationships and support for action/reponse before an event occurs; Increase data sharing; Document and share success stories;	PostScript models and validation are underway; Conservation Finance opportunities exist for private investment/beneficiaries to support efforts; CA private land Emergency Forest Restoration Teams	BAR team for rapid assessment and response for restoration assessment and action; Programmatic pre-fire planning that could be immediately evaluated after an event; Additional exemptions for NEPA; Data cooperative for sharing information and learning across landscapes
		Increase capacity for providing reforestation materials (cones, seeds, seedlings); Build robust networks of collaboration and cooperation; Use predictive sowing to make seedlings more readily available than an order-based system	Lack of skilled workforce to collect cones, grow seedlings, etc.;	Create opportunities for private sector and or citizen science to participate in planting and or cone surveys (e.g., like the CALFIRE cone spotting app and education material for public involvement and support, California naturalist program, incentives for private landowners); Orchard development; Leverage technologies (ex. drones and remote sensing); Increase use of climatic / physiological based growing; Leverage existing planned/ongoing actions, such as utility tree felling or thinning projects, to increase opportunities for collecting seeds; for example, create a system to coordinate with felling crews for utilities and insert a seed collection crew between fellers and cleanup crew.	Technology to get more seedlings from seeds like Somatic embryogenesis (SE); Reforestation Pipeline Partnership investment by Agencies and partners; The ease of developing and sharing apps; Public interest in reforestation;	Operationalize somatic embryogenesis; Significant investments in workforce development; Develop training materials and public participation opportunities
Breakout Group 4 / **Sustainably manage forests and associated natural lands that are capable of persisting in current and future climatic conditions**	Produce climate-ready guidance to inform reforestation that managers and private landowners understand and know how to use		Lack of social license for offering guidance when there is some uncertainty			Post-fire restoration NEPA for all of the NFs in the State.
			Not enough seed stock, in part due to limited availability of climbers to gather cones	Invest in research and development to develop drones capable of collecting cones	Unprecedented federal funding in USFS	Long-term staffing investments, including backfilling retired positions and creating pathways for growth to attract early-mid employees
	Restore climate resilient forest conditions	Reduce fuel loads	Lack of skilled, funded, and permanent/dedicated workforce	Permit federal and state management agencies to hire more FTEs and at competitive salaries, benefits, and location flexibility	Drone technology to light large scale prescribed fires and or collect cones	Add a line-item in national USFS budget for public education and interpretation
		Replant with climate-adaptable species	Managing for multiple benefits is hard and resource intensive	Increase awareness, partnering, and communication between land managers and beneficiaries to build support for resources (e.g., offering better incentives and more effective information campaigns)		Institute policies that remove liability and threat of punishments (real or perceived) to encourage USFS line officers to embrace reasonable risks that offer benefits