

# Memo



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**Date:** August 9, 2024

**To:** David Morrison, Brian Bordona, Jamison Crosby, Ryan Melendez (County of Napa); and Deborah Elliott (City of Napa)

**From:** Adam Qian, Erik de Kok, Honey Walters (Ascent, Inc.)

**Subject:** Napa County Regional Climate Action and Adaptation Plan: Draft Climate Adaptation Strategies, Measures and Actions

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## 1 INTRODUCTION

This memorandum (memo) identifies proposed draft climate adaptation strategies, measures, and actions that the County of Napa (County) and the incorporated jurisdictions can consider for inclusion in the countywide Regional Climate Action and Adaptation Plan (RCAAP). The draft climate adaptation strategies, measures, and actions identified in this memo are designed to complement and expand upon existing regional and local efforts to address climate-related hazards.

Ascent first conducted a review of the hazard mitigation and general plan safety element actions and measures already outlined in the [County's 2020 Multi-Jurisdictional Hazard Mitigation Plan](#) (MJHMP), the [City of Napa's 2021 Local Hazard Mitigation Plan](#) (LHMP), and the safety elements included in the County and local jurisdictions' general plans, to understand existing policies and measures already in place and identify any potential gaps in addressing climate vulnerabilities. As shown in the matrix in Attachment 1, existing policies and measures were categorized by hazard types and corresponding jurisdictions. This comprehensive compilation of existing hazard mitigation and general plan safety element policies and actions serves as the foundation for developing adaptation strategies, measures, and actions in this memo.

The primary objective of the proposed climate adaptation strategies, measures, and actions is to enhance the capacity of the County, local jurisdictions, and other regional or local agencies to adapt to climate stressors and bolster regional climate resilience. Adaptation measures may also have important co-benefits, such as reducing GHG emissions, and some of these co-benefits are identified; however, further identification of co-benefits will be completed as part of the RCAAP process. In this memo, "County" refers to the County of Napa as a local government agency, while "county" refers to the entire geographic area known as Napa County.

This memo includes the following:

- ▶ A framework for climate adaptation strategies, measures, and actions;
- ▶ A set of six climate adaptation strategies, with corresponding measures and actions to be considered for inclusion in the countywide RCAAP;
- ▶ An implementation matrix with example adaptation strategies, measures, and actions; and
- ▶ A summary of existing policies and implementation measures already in place in adopted local hazard mitigation plans, general plan safety elements, or other related plans (Attachment 1).

## 2 FRAMEWORK FOR CLIMATE ADAPTATION STRATEGIES, MEASURES, AND ACTIONS

Ascent proposes a three-pronged adaptation framework that is comprised of high-level, overarching adaptation strategies and a suite of measures and actions associated with each strategy. The definitions of strategies, measures, and actions are explained below:

- ▶ Strategies are overarching goals and guidelines for adapting to changing climate conditions and climate hazards.
- ▶ Measures refer to more specific policies or categories of action intended to achieve the strategies and overarching goals.
- ▶ Actions are more detailed implementation steps that various actors will take to realize the measures. Actions help break down measures into specific actionable steps, such as programs, projects, etc. Note that action(s) may not be necessary if the corresponding measure is already sufficiently specific for implementation.

## 3 CLIMATE ADAPTATION STRATEGIES, MEASURES, AND ACTIONS

Ascent proposes six adaptation strategies, employing a streamlined approach to address various climate stressors. The first strategy aims to enhance regional climate resilience, irrespective of specific climate impacts. The remaining five strategies directly align with the climate change effects identified in the Climate Vulnerability Assessment: increased wildfire risk; increased temperatures and extreme heat; extreme precipitation, sea level rise, and flooding; drought and water supply; and energy grid resiliency. The measures and actions within each strategy define the programs, policies, and regulations that the County, its jurisdictions, and other regional or local agencies will need to implement to prepare for and adapt to the challenges created by climate stressors.

During the development of these adaptation strategies, measures, and actions, particular emphasis was placed on addressing climate change effects deemed to pose the most significant threats to the county, as identified in the Climate Vulnerability Assessment. Specifically, heightened attention is directed towards increased temperatures and extreme heat, as well as drought and water supply.

Below are the six adaptation strategies proposed for the RCAAP, with specific measures and actions included under each strategy:

- ▶ Strategy 1: Improve the Overall Climate Resilience of Napa County.
- ▶ Strategy 2: Prepare for and Adapt to Increased Wildfire Risk.
- ▶ Strategy 3: Prepare for Increased Temperatures and More Frequent Extreme Heat Events.
- ▶ Strategy 4: Prepare for More Frequent Extreme Precipitation and Flooding Events, Combined with Sea Level Rise Threat.
- ▶ Strategy 5: Prepare for More Frequent Drought Events and Enhance the Region's Overall Water Supply Resilience.
- ▶ Strategy 6: Improve the Region's Energy Grid Resilience.

Note that 10 of the measures are recommended for more detailed analysis of implementation cost and funding, which are identified with a green star symbol. ★

## STRATEGY 1: IMPROVE THE COUNTY AND ITS JURISDICTIONS' OVERALL CLIMATE RESILIENCE

Measures identified under this strategy focus on preparing the County and its jurisdictions for impacts from more than one climate stressor. Ascent assessed the County and its jurisdictions' existing hazard mitigation actions and general plan safety element measures that target multiple hazards. The County and its jurisdictions already have 50+ existing hazard mitigation actions and safety element measures that target multiple hazards. Therefore, the adaptation measures proposed here serve as additional measures to supplement the existing measures by addressing gaps or further enhancing the County and its jurisdictions' climate resilience without creating redundancy.

Measures and actions proposed for Strategy 1 start with "Measure/Action All", followed by measure and action numbers.

### **Measure All-1: Implement and monitor the effectiveness of existing policies, actions, and measures identified in existing planning mechanisms, including, but not limited to, the hazard mitigation plan(s) and the 2023 Safety Element.**

- ▶ Action All-1.1: Collaborate among departments and jurisdictions to ensure progress on actions and measures already proposed in existing planning mechanisms.
- ▶ Action All-1.2: Adhere to the monitoring, evaluating, and updating process proposed in the County's MJHMP and the City of Napa's LHMP to ensure progress is being made on proposed hazard mitigation actions, especially those rated to have extreme and high priorities during the hazard mitigation planning processes. Make changes and updates to these actions if necessary.

### **Measure All-2: Promote the implementation of measures and actions that are applicable throughout the region.**

- ▶ Action All-2.1: Advocate for measures and actions that are applicable countywide, regardless of whether they have been identified in the existing planning mechanisms of individual jurisdictions. Such measures and actions include initiatives such as extensive outreach to vulnerable communities and the development and implementation of public campaigns aimed at raising awareness about climate change adaptation.

### **★ Measure All-3: Increase the climate resilience of existing and new residential and commercial development through structural strengthening and hardening to adapt to multiple climate stressors.**

- ▶ Action All-3.1: Prepare existing and new residential and commercial developments in FEMA 100-year and 500-year floodplains for flooding events by waterproofing structures and foundations, using flood-resistant materials, retrofitting existing structures with flood-resistant features, or other appropriate flooding mitigation measures.
- ▶ Action All-3.2: Reduce wildfire risk in existing and new residential and commercial developments by creating and maintaining defensible spaces and fire breaks, hardening structures with fire-resistant materials, or other appropriate wildfire risk reduction measures. The Napa County Fire Department should also conduct annual inspections to ensure the maintenance of these measures.
- ▶ Action All-3.3: Encourage and incentivize the use of pervious paving and climate-smart landscaped surfaces in new and existing developments to prepare for more frequent extreme heat, drought, and flooding events.

#### **Measure All-4: Incorporate considerations of climate change and health equity into all governmental initiatives and fundamental operations.**

- ▶ Action All-4.1: Adopt a "Health in All Policies" approach through a resolution adopted by all jurisdictions, establishing a structural framework that integrates health considerations, including climate change and health equity, into regional policies, considerations, and practices. Multiple sectors must collaborate to address global issues that transcend geographical, political, and jurisdictional boundaries, such as climate change. This approach aims to improve regional health while simultaneously advancing other goals.
- ▶ Action All-4.2: Ensure that public health initiatives serving vulnerable communities address the disproportional impacts of climate stressors on these communities. Such public health initiatives may include the Community Organizations Active in Disaster and those initiated by Live Healthy Napa County (e.g., Community Health Improvement Plan, Community Health Assessment).
- ▶ Action All-4.3: Work with local medical providers and hospitals to ensure that medical facilities are prepared to meet increased demand because of more frequent hazardous events.

#### **★ Measure All-5: Improve the resilience of the region's transportation infrastructure against climate stressors.**

- ▶ Action All-5.1: Revise maintenance protocols for transportation systems to integrate considerations of climate vulnerabilities, such as reducing fuel load regularly for wildfire events and inspecting stormwater collection systems regularly for flooding events. Ensure sufficient funding and capacity to routinely conduct maintenance measures at the best possible scale.
- ▶ Action All-5.2: Collaborate with community members, transportation agencies, and private entities to identify vulnerable local and regional transportation, transit, and active transportation corridors in the face of climate change impacts; utilize the latest scientific insights and resilient design elements such as green streets in transportation infrastructure to enhance the resilience of these corridors against extreme climate events.
- ▶ Action All-5.3: Collaborate with regional transportation agencies to establish redundancy for vital transportation routes, ensuring continuous access and mobility during emergencies; identify alternative routes and stops to mitigate disruptions in case of damage or closure of primary infrastructure due to extreme events.

#### **Measure All-6: Improve the resilience of the region's agricultural industry against climate stressors.**

- ▶ Action All-6.1: Conduct a review of existing land use plans, including general plan land use elements, zoning codes, and development standards, to ensure that they are not creating unintended barriers to the continued viability of agricultural areas as climate conditions change. For example, this may involve consideration of permitting certain types of agricultural activities in areas where they were previously deemed unsuitable.
- ▶ Action All-6.2: Construct solar shade structures and/or plant trees to protect livestock and agricultural workforce from the impacts of extreme heat.

#### **★ Measure All-7: Guard the region's biodiversity and ecologic habitats from the impacts of various climate stressors.**

- ▶ Action All-7.1: Promote biodiversity and enhance species' climate resilience by implementing nature-based solutions, green infrastructure (e.g., bioswales in parking lots), and best management practices to reduce runoff, enhance infiltration, and increase recharge, as well as wetland and riparian corridor restoration.

- ▶ Action All-7.2: Coordinate with the Napa County Groundwater Sustainability Agency (NCGSA) to fully implement the [Interconnected Surface Water and Groundwater Dependent Ecosystems Workplan: Napa Valley Subbasin](#) (ISW/GDE Workplan).
- ▶ Action All-7.3: Consider expanding the geographic scope of the ISW/GDE Workplan to areas outside the Napa Valley Subbasin and potentially the entire County.
- ▶ Action All-7.4: Encourage carbon farming and other sustainable land management activities that improve soil health and water quality, improve habitat quality, reduce invasive species, and restore the health and diversity of species native to Napa County and other adjacent regions that may be more adaptable to warming temperatures (Note: carbon farming and other measures are also included in the GHG reduction measures and actions, which will have adaptation and resilience co-benefits in connection with this action).

### ★ **Measure All-8: Incorporate climate change considerations into the County and its jurisdictions' emergency management planning and response processes.**

- ▶ Action All-8.1: Incorporate insights from the Climate Vulnerability Assessment across all stages of emergency management planning, encompassing mitigation, preparedness, response, and recovery endeavors.
- ▶ Action All-8.2: Ensure that emergency management activities are executed equitably by prioritizing the safety of identified vulnerable communities within the county; continuously implement existing emergency management policies and initiatives to address the needs of vulnerable communities (see Section 2.2.1 of the Climate Vulnerability Assessment for a discussion of how vulnerable communities are defined).
- ▶ Action All-8.3: Identify potential locations throughout the county for siting new community resilience centers or “resilience hubs”, either through new construction or repurposing of existing facilities. Resilience hubs provide places of refuge for vulnerable community members during power outages, extreme weather events, wildfires, or other disasters. They can also provide important functions that benefit the community during steady-state periods, such as providing a location for job training, after-school programs, skills development, resource sharing, and other community-building and empowerment functions. For facilities already identified as resilience hubs, create a timeline to upgrade essential equipment and improve building shells to enhance their overall resilience.

## **STRATEGY 2: PREPARE FOR AND ADAPT TO INCREASED WILDFIRE RISK**

The measures proposed under this strategy focus on preparing the County and participating jurisdictions for more frequent and severe wildfire events, while also reducing risk and recognizing the role that beneficial fire plays in the county's ecosystems. Ascent assessed the County and its jurisdictions' existing hazard mitigation actions and general plan safety element measures that target increased wildfire risk. The County and its jurisdictions already have around one hundred existing wildfire-focused hazard mitigation actions and safety element measures. Therefore, the adaptation measures proposed here serve as additional measures to supplement the existing hazard mitigation actions and safety element measures by addressing gaps or further enhancing the County and its jurisdictions' climate resilience against increased wildfire risk without creating redundancy.

Wildfire risk reduction measures, especially those focused on vegetation management, fuel modification, fuel breaks, prescribed burns, and similar activities, help to reduce the spread and severity of wildfires. These types of hazard mitigation measures and their implementing actions may have important GHG emissions reduction co-benefits, including the reduction of black carbon which, although non-anthropogenic, is considered a short-lived climate pollutant.

Measures and actions proposed for Strategy 2 start with “Measure/Action Fire”, followed by measure and action numbers.

**Measure Fire-1: Map and identify locations that are newly at risk, or at higher risk for fire hazards because of climate change.**

- ▶ Action Fire-1.1: Work with the California Department of Forestry and Fire Protection (CAL FIRE), Napa County Fire Marshall, Napa Communities Firewise Foundation (NCFE), and fire departments operating within the county to map and identify locations that are newly at risk, or at higher risk, for wildfire hazards as a result of climate change and its impacts; implement wildfire mitigation best practices such as the ones mentioned in Action All-3.2 in these mapped and identified locations.

**Measure Fire-2: Coordinate with State and local agencies to establish post-fire ecological recovery programs.**

- ▶ Action Fire-2.1: Coordinate with CAL FIRE, NCFE, and other similar agencies to establish post-fire ecological recovery programs to support ecological restoration efforts. Such ecological restoration endeavors could include the reintroduction and establishment of native species, and ecologically-beneficial vegetation management techniques (e.g., prescribed burns, invasive species removal) that would reduce the potential for high-intensity wildfires and improve the resilience of the County's wildlands.

**Measure Fire-3: Ensure that best practices for wildfire mitigation that apply to the region are implemented consistently throughout the county.**

- ▶ Action Fire-3.1: Ensure that wildfire mitigation best practices, such as creating defensible space and fuel reduction projects, are planned and implemented regularly and consistently in all jurisdictions in the region. This may require developing regionally consistent local plans, codes, or programs that help to address gaps in local planning, code compliance, or project development, or providing regional access to funding sources to ensure local needs are met. Meanwhile, wildfire mitigation best practices should be implemented with caution to prevent exacerbating erosion and runoff problems, especially during rainy seasons.

**Measure Fire-4: Plan new development strategically in High or Very High Fire Hazard Severity Zones**

- ▶ Action Fire-4.1: Plan new development strategically to minimize risk in High or Very High Fire Hazard Severity Zones throughout the county, according to the most recent and available CAL FIRE hazard severity zones maps, and consider projections of future climate change when planning future land uses. For example, the City of St. Helena already has an existing action to limit development in High or Very High Fire Hazard Severity Zones.

**★ Measure Fire-5: Enhance forest resilience, reduce tree mortality, and manage beetle infestations**

- ▶ Action Fire-5.1: Set up a network of monitoring stations to detect beetle infestations early. Utilize satellite imagery and drone technology to monitor large forest areas for signs of beetle activity and tree health.
- ▶ Action Fire-5.2: Implement selective thinning and pruning to reduce tree density and remove infested or weakened trees, making forests less susceptible to beetle outbreaks. Promote biodiversity by planting a variety of tree species that are less susceptible to beetle infestations.

**Measure Fire-6: Improve public awareness and community resilience against wildfire smoke**

- ▶ Action Fire-6.1: Partner with the California Division of Occupational Safety and Health and other regional agencies to promote educational campaigns on the health effects of wildfire smoke and preventative measures.
- ▶ Action Fire-6.2: Implement and promote an early warning system that alerts county residents to upcoming smoke events via multiple media forms (e.g., radio, text messaging, ALERT Napa County). Provide real-time updates on air quality.

- ▶ Action Fire-6.3: Protect outdoor workers from wildfire smoke. Establish policies that limit outdoor work during periods of poor air quality. Provide training on how to use personal protective equipment and recognize symptoms of smoke-related health issues, such as respiratory problems and irritations. Ensure that work sites are equipped with shaded areas and adequate ventilation to reduce exposure to smoke. Whenever possible, modify work processes to allow tasks to be performed indoors or in controlled environments.

## STRATEGY 3: PREPARE FOR INCREASED TEMPERATURES AND MORE FREQUENT EXTREME HEAT EVENTS

The measures proposed here focus on preparing the County and participating jurisdictions for increased temperatures and more frequent extreme heat events. The County and its jurisdictions already have around six existing hazard mitigation actions and safety element measures that address increased temperatures and extreme heat. Ascent proposes the following measures in addition to these existing measures.

Measures and actions proposed for Strategy 3 start with “Measure/Action Temp,” followed by measure and action numbers.

### **Measure Temp-1: Work with the California Division of Occupational Safety and Health and employers to provide outdoor workers with sufficient protection from extreme heat conditions, ensuring the maintenance of healthy and safe working environments.**

- ▶ Action Temp-1.1: Establish and implement standardized protocols, consistent with existing heat-related illness prevention regulations (CA Code of Regulations, Title 8), to regulate outdoor workers’ activities working outside during extreme heat events, such as a threshold of maximum temperature allowed or mandatory breaks after a certain period.
- ▶ Action Temp-1.2: Expand employer and worker training in industries with outdoor work, including assurance of adequate water, shade, protection from poor air quality, training of heat impacts, and vector-borne diseases.

### **★ Measure Temp-2: Create or enhance programs focused on urban greening and urban agriculture and engage community-based organizations to develop and implement these programs.**

- ▶ Action Temp-2.1: Develop policies and management strategies to foster the growth and preservation of urban forests, encourage the adoption of best practices for removing unhealthy, dangerous, or destructive trees, and plant and long-term maintain site-appropriate trees.
- ▶ Action Temp-2.2: Identify communities lacking access to parks and prioritize the establishment of new urban parks and trail systems within walking distance of underserved populations.
- ▶ Action Temp-2.3: Ensure newly established urban parks and trail systems are connected to high-density residential areas, workplaces, and offices.
- ▶ Action Temp-2.4: Increase parking lot shading by revising parking lot shading standards in local codes to provide larger minimum sizes for tree planters to improve tree health, and prioritize tree species that maximize carbon sequestration potential. Consult the California Urban Forests Council for guidance and standards and the best available technologies and practices for selecting planting media for urban trees in challenging environments. Meanwhile, consider incorporating solar panel structures and/or other renewable energy capture technologies to provide shading without removing existing trees.
- ▶ Action Temp-2.5: Enhance shading for active commuters by increasing greenery along bike paths and streets.

**Measure Temp-3: Alleviate the effects of extreme heat on populations dependent on walking and/or public transportation.**

- ▶ Action Temp-3.1: Partner with public works departments and regional transit providers to provide site-appropriate shade trees and/or shade structures to enhance shading and incorporate heat-mitigating materials on pedestrian walkways and transit stops.
- ▶ Action Temp-3.2: Collaborate with regional partners to obtain guidance, explore pilot projects, or obtain other technical support to identify and determine cool pavement technologies best suited for different applications in the county.
- ▶ Action Temp-3.3: Install water fountains at transit stops if possible.

Action Temp-5.4: Explore the use of vine canopies or vegetable awnings/sails over walkways and streets to improve shading in urbanized areas such as downtown Napa.

**Measure Temp-4: Protect critical infrastructure vulnerable to extreme heat events.**

- ▶ Action Temp-4.1: In cases where existing communication, energy, public service, and transportation facilities and infrastructure are found to be vulnerable to extreme heat, bolster and/or upgrade associated infrastructure to be more resilient to periods of high heat (e.g., use of heat-tolerant materials).

**Measure Temp-5: Encourage or require the installation or use of cool-roof technologies, passive solar home design, green roofs, and rooftop gardens.**

- ▶ Action Temp-5.1: Consider adopting a mandatory green building code that requires installation of cool roof technologies for new development consistent with the 2022 or the upcoming 2025 Building Energy Efficiency Standards for Residential and Nonresidential Buildings (California Building Code, Title 24, Part 6). Cool roofs are designed to maintain a lower roof temperature than traditional roofs that are heated through sun exposure and contribute to the urban heat island effect.
- ▶ Action Temp-5.2: Develop incentive programs such as permit streamlining, permit fee reductions, or tax rebates for developers and landowners to apply passive solar home design to future residential buildings. A home that employs passive solar home design has windows oriented toward the south, is composed of materials of high heat absorption, and is built to distribute heat and cold air throughout the home. The use of these design elements provides natural cooling and heating and reduces energy demand.
- ▶ Action Temp-5.3: Develop incentive programs such as permit streamlining, permit fee reductions, or tax rebates to encourage the use of rooftop gardens and green roofs in residential and commercial buildings. Rooftop gardens are gardens on rooftops, and green roofs (or living roofs) are rooftops that are partially or completely covered by vegetation. These forms of roofing lower the amount of heat absorbed by a building and reduce the energy demand associated with air conditioning.

**STRATEGY 4: PREPARE FOR MORE FREQUENT EXTREME PRECIPITATION AND FLOODING EVENTS, COMBINED WITH SEA LEVEL RISE THREAT**

The measures proposed under this strategy focus on improving the County and jurisdictions' resilience against more frequent and extreme precipitation and flooding events, as well as the threat posed by sea level rise. Ascent assessed the existing hazard mitigation actions and general plan safety element measures that target more frequent extreme precipitation and flooding events, combined with sea level rise. The County and its jurisdictions already have around 90 existing hazard mitigation actions and safety element measures targeting these climate stressors. Therefore, the adaptation measures proposed here serve as additional measures to supplement the existing hazard mitigation

actions and safety element measures by addressing gaps or further enhancing climate resilience against more frequent extreme precipitation and flooding events, as well as sea level rise without creating redundancy.

Measures and actions proposed for Strategy 4 start with “Measure/Action Flood,” followed by measure and action numbers.

### **Measure Flood-1: Consider the implementation of low-impact development (LID) to reduce local flooding.**

- ▶ Action Flood-1.1: Continue to implement the Phase II Small MS4 Permit which requires green infrastructure on all new and redevelopment projects creating or replacing >5,000 sq ft of impervious surface to capture, infiltrate, and treat stormwater close to its source, such as rain gardens, bioswales, permeable pavement, green roofs, and constructed wetlands.
- ▶ Action Flood-1.2: Jurisdictions may consider implementing a “reach code” for LID by requiring LID to be installed on all new and redevelopment projects creating or replacing <5,000 SF of impervious surface.

### **★ Measure Flood-2: Evaluate and improve the capacity of stormwater infrastructure for high-intensity rainfall events.**

- ▶ Action Flood-2.1: Invest in green infrastructure, such as rain gardens, bioswales, stormwater tree trenches, green roofs, detention basins, and rain barrels, to reduce peak runoff, filter stormwater, and increase groundwater recharge where needed.
- ▶ Action Flood-2.2: Increase maintenance and cleaning of gutters, drainage ditches, and culverts to maximize drainage capacity. The County and most jurisdictions already have similar actions included in their existing planning mechanisms.
- ▶ Action Flood-2.3: Invest in and enhance the capacity of stormwater infrastructure to manage high-intensity rainfall events. Continue implementing the Phase II Small MS4 Permit, with a focus on meeting its enhanced requirements for stormwater asset maintenance and improvement planning.

### **Measure Flood-3: Improve sewage and solid-waste management infrastructure.**

- ▶ Action Flood-3.1: Coordinate with sanitation districts and waste management agencies in the region to improve sewage and solid-waste management infrastructure. The evaluation and improvement of existing undersized or inadequate sewage and solid-waste management infrastructure could lessen the occurrences of floodwater contamination, thereby reducing the spread of pollution and degraded water quality.

### **Measure Flood-4: Identify new locations for flood control, prioritizing green infrastructure solutions.**

- ▶ Action Flood-4.1: Identify new locations suitable for multi-benefit flood control (e.g., underused agricultural areas, small streams) that encourage groundwater recharge, and habitat restoration (e.g., wetlands); identify priority projects in coordination with Napa County Flood Control and Water Conservation District, the Napa County Resource Conservation District, the NCGSA, Napa Green, and other agricultural and environmental organizations.

### **Measure Flood-5: Upgrade and/or relocate infrastructure and critical facilities exposed to flooding identified via GIS-based spatial analysis.**

- ▶ Action Flood-5.1: Upgrade and/or relocate infrastructure and critical facilities exposed to flooding hazards to make them more resilient to flooding, based on GIS-based spatial analyses already identified in local hazard mitigation planning efforts.

**Measure Flood-6: Replant bare or disturbed areas.**

- ▶ Action Flood-6.1: Assess and map areas with bare soil or significant disturbance due to natural hazards such as wildfire events and/or anthropogenic changes to prioritize restoration effort. Analyze the potential for runoff, erosion, and sedimentation in identified sites. Implement targeted restoration activities where feasible by selecting appropriate vegetation, applying erosion control measures, and following best management practices.

**Measure Flood-7: Safeguard freshwater supply against contamination, degradation, or loss.**

- ▶ Action Flood-7.1: Support investments in new and/or upgraded existing infrastructure to ensure that freshwater supplies are not contaminated, degraded, or lost during flood or fire events. Safeguarding freshwater supply sources through infrastructure improvements and watershed protections would improve the County and its jurisdictions' ability to provide drinking water to its residents during flood events.

**Measure Flood-8: Improve flood warning and information dissemination implementation.**

- ▶ Action Flood-8.1: Partner with the Napa County Flood Control and Water Conservation District and National Weather Service to deliver robust multi-lingual education and outreach materials accessible across multiple media forms (e.g., radio, text messaging) to publicize information regarding potential day-to-day flood risk, how to sign up for the ALERT Napa County and access Napa County's real-time rainfall and river-stream level monitoring website ([napa.onerain.com](https://napa.onerain.com)), emergency supplies, pet protection, key terminology, electrical safety, and evacuation routes in the case of flooding.
- ▶ Action Flood-8.2: Invest resources and personnel to regularly update the Ready Napa County webpage (<https://readynapacounty.org/>) to include current information.

**Measure Flood-9: Address and adapt to the long-term impacts of sea level rise.**

- ▶ Action Flood-9.1: Prepare a detailed asset-level assessment of local vulnerability against sea level rise, including at-risk critical facilities, infrastructure, and properties such as roads, bridges, airport facilities, and water reclamation facilities, as well as buildings and properties in inundation areas.
- ▶ Action Flood-9.2: Develop a regional adaptive management plan to address the long-term impacts of sea level rise based on the asset-level vulnerability assessment. Collaborate with regional partners in addressing sea level rise, such as the San Francisco Bay Conservation and Development Commission and the Metropolitan Transportation Commission.

**Measure Flood-10: Support ongoing analysis of sea level rise data and guide future development out of areas vulnerable to sea level rise.**

- ▶ Action Flood-10.1: The County's current planning mechanisms already include supporting the ongoing analysis of sea level rise data as an existing action. The County and the City of American Canyon should further collaborate on the effort, and guide future development out of exposed areas based on the analysis.
- ▶ Action Flood-10.2: Coordinate with the NCGSA regarding the evaluation of sea level rise. The NCGSA's Groundwater Sustainability Plan (GSP) Section 12 recommends installing two additional monitoring wells to enhance the region's seawater intrusion monitoring network. This will improve the spatial and temporal resolution of groundwater salinity monitoring, helping to track the saline/freshwater interface more accurately.

**Measure Flood-11: Consider the implications of sea level rise when planning future capital improvement projects and new development projects.**

- ▶ Action Flood-11.1: Update capital improvement plans for critical infrastructure to address the effects of future sea level rise and associated hazards in potentially affected areas, including the southwestern portion of the county, the western portion of the City of American Canyon, and certain low-lying areas along the Napa River in the City of Napa, where tidal influence extends to Third Street.

- ▶ Action Flood-11.2: Design and locate future critical infrastructure projects accordingly and away from potential inundation areas such as those mentioned in Action Flood-12.1, using sea level rise data.
- ▶ Action Flood-11.3: Require that all new development applications consider projected sea level rise and implement sufficient protective measures such as installing flood barriers, retrofitting stormwater drainage systems, and implementing green infrastructure as mentioned in Measure Flood-1; and avoid siting new development projects in areas subject to permanent inundation.

### **Measure Flood-12: Preserve undeveloped land to support ecosystem adaptation to sea level rise impacts.**

- ▶ Action Flood-12.1: Conserve undeveloped land to facilitate ecosystem adaptation in regions where sea level rise could lead to the inland migration of species and habitats, such regions include the southwestern portion of the county and the western portion of the City of American Canyon.

## **STRATEGY 5: PREPARE FOR MORE FREQUENT DROUGHT EVENTS AND ENHANCE THE REGION’S OVERALL WATER SUPPLY RESILIENCE**

As discussed in the Climate Vulnerability Assessment, although periods of precipitation are projected to be wetter and winter storms are predicted to be more intense and damaging, on an annual basis, there will likely be fewer total days with precipitation. Furthermore, climate projections show a likely increase in extreme dry events, which may result in severe and prolonged drought in the county. Therefore, the measures proposed here focus on preparing the County and participating jurisdictions for more frequent drought events, and enhancing the region’s overall water supply resilience. The County and its jurisdictions have around 23 existing hazard mitigation actions and safety element measures that address drought events and water supply resilience. Ascent proposes the following measures in addition to these existing measures.

Measures and actions proposed for Strategy 5 start with “Measure/Action Drought”, followed by measure and action numbers.

### **Measure Drought-1: Ensure the implementation of the region’s water conservation endeavors and explore options for the use of recycled water.**

- ▶ Action Drought-1.1: Raise the region’s public awareness of water conservation and expand conservation incentives such as cash for grass and rebates for low-flow devices. Further, incentivize water conservation infrastructure upgrade projects such as Cash for Grass and leak detection programs.
- ▶ Action Drought-1.2: Ensure the implementation of regional and local water conservation opportunities. For water conservation in the building sector, consider adopting California Plumbing Code Appendix M. This code supports the use of smaller diameter pipes and fittings, valves, pumps, and other equipment, as well as smaller inside diameter pipe insulation. Additionally, it advocates for a smaller water service entrance size, leading to a reduced water meter size and lower connection fees.
- ▶ Action Drought-1.3: Increase on-site greywater and rainwater reuse, stormwater reuse, managed aquifer recharge, and expand the use of recycled water.
- ▶ Action Drought-1.4: Determine the feasibility of incentive programs that promote the deployment of on-site rainwater catchment systems, such as rain barrels, rain gardens, cisterns, and other mechanisms, to capture and store rainwater for use during the dry season for water customers.

## Measure Drought-2: Support the region’s agricultural industry to adapt to more frequent and severe drought events.

- ▶ Action Drought-2.1: Promote and incentivize industry adoption of state-of-the-art water conservation practices in the cultivation of varietal grapes and other crops and breeding of livestock animals that are better suited to thrive in warmer temperatures and increased precipitation variability. Incentivize growers to perform regular (e.g., at least every 5 years) irrigation distribution uniformity testing and implement upgrades to their irrigation systems as indicated by uniformity testing results. Expand the use of drip irrigation or other efficient irrigation practices countywide and consider implementing regulations for night-only outdoor urban watering practices to minimize evaporation during the daytime.
- ▶ Action Drought-2.2: Incentivize broad-scale groundwater recharge by promoting soil health through best management practices. Implement cover crops, apply organic compost, and adopt measures that enhance water infiltration into vineyard soils.
- ▶ Action Drought-2.3: Napa County GSA should collaborate with representatives of the agricultural community to develop incentives for grape growers, winemakers and other users to adopt water conservation practices beyond drip irrigation. Comprehensively implement the NCGSA’s [Napa County Water Conservation Workplan: A Guide for Vineyards, Wineries and Other Water Users](#) (WC Workplan) and [Groundwater Pumping Reduction Workplan: Napa Valley Subbasin](#) (GPR Workplan).
- ▶ Action Drought-2.4: The Napa County Board of Supervisors could consider expanding the geographic scope of the aforementioned Napa County WC Workplan and GPR Workplan to areas outside the Napa Valley Subbasin and potentially the entire county.

## ★ Measure Drought-3: Support efforts to evaluate vulnerabilities of water supply systems and networks and develop strategies to improve water supply resilience.

- ▶ Action Drought-3.1: The Cities of American Canyon, St. Helena, and the Town of Yountville should evaluate the vulnerability of the local water supply systems and networks to climate impacts and develop strategies to add resilience to these systems. Resilient water supply systems must be able to deliver services during disruptive events (e.g., storms, drought).
- ▶ Action Drought-3.2: Work with local water providers to adopt municipal codes to enforce resiliency standards for water-related infrastructure for all future development. Municipal codes may include but are not limited to, standards related to the elevation of electrical generators and/or tanks and containers of hazardous materials, increased capacity of water storage tanks, and improved deployment of backflow preventers to impede contamination of drinking water following an extreme weather event (e.g., storms).
- ▶ Action Drought-3.3: Encourage and support local water agencies' efforts to conduct ongoing maintenance of existing water supply–related infrastructure to identify potential weaknesses and deterioration.
- ▶ Action Drought-3.4: Implement the drought mitigation measures proposed in the 2022 Napa Valley Drought Contingency Plan and the Drought Resilience Plan currently under development in response to SB 552.

## Measure Drought-4: Expand upon existing water conservation education outreach programs for residents and businesses.

- ▶ Action Drought-4.1: Expand communication of water conservation–related education and tips through multiple media platforms (e.g., radio, television, social media) to increase awareness of indoor and outdoor conservation methods. Take steps to ensure that “Water Conservation as a Napa Way of Life” becomes deeply ingrained in the community.

- ▶ Action Drought-4.2: Expand educational materials available to water users through websites and customer bills and expand the audience to include self-supplied users of groundwater, especially in the Napa Valley Subbasin.

### **Measure Drought-5: Collaborate with federal, State, and local agencies and organizations to identify future water supplies, explore alternative supply sources, and improve capacity.**

- ▶ Action Drought-5.1: Pursue grant funding opportunities from the State Water Resources Control Board (SWRCB), the California Department of Water Resources (DWR), the Bureau of Reclamation (Reclamation), the U.S. Army Corps of Engineers (USACE) and other State and federal agencies related to water recycling projects, and/or other water resource planning projects.
- ▶ Action Drought-5.2: Explore water supply options for the future and collaborate on water conservation strategies to improve regional water supply capacity; engage with SWRCB, DWR, Reclamation, USACE, groundwater sustainability agencies, flood control agencies, and other local, State, and federal agencies to identify new sources of water supply and groundwater recharge. Support ongoing efforts by entities, including the Abuelitos Foundation, to replenish the Napa River Watershed.

## **STRATEGY 6: IMPROVE THE REGION’S ENERGY GRID RESILIENCE**

The measures proposed here focus on improving the County and its jurisdictions’ energy grid resilience. Some of the measures are also related to other strategies. Wildfire, extreme heat, and flooding hazards can impact energy grids. There are already 10 existing hazard mitigation actions and safety element measures for energy grid resilience. Ascent proposes the following measures in addition to these existing measures.

Measures and actions proposed for Strategy 6 start with “Measure/Action Energy”, followed by measure and action numbers.

### **Measure Energy-1: Consider transitioning to climate-smart sources of energy.**

- ▶ Action Energy-1.1: Encourage the County and its jurisdictions to evaluate opportunities to transition energy sources to renewable and decentralized options, reducing reliance on centralized generation sources and long-range transmission (e.g., see MCE’s Virtual Power Plant Pilot Program).

### **★ Measure Energy-2: Enhance the resilience of energy infrastructure systems against climate-related impacts and collaborate with PG&E and MCE to bolster redundancy in the energy network.**

- ▶ Action Energy-2.1: Harden energy infrastructure against various climate stressors, such as undergrounding transmission lines for wildfire events and installing barriers and floodgates for flooding hazards.

### **Measure Energy-3: Minimize stress on the region’s energy grids during extreme heat events.**

- ▶ Action Energy-3.1: Reduce stress on the electrical grid by educating the public on behavior changes such as time-of-use awareness, or reducing electric usage during statewide or regional “Flex Your Power” alerts. Partner with PG&E and MCE to promote educational campaigns that encourage such behavior changes.
- ▶ Action Energy-3.2: Expand the use of home batteries, vehicle-to-grid integration technology, and other energy storage technologies in residential and non-residential buildings to improve backup power supply availability while also improving the viability of on-site renewable energy (Note: see also GHG reduction measures that encourage installation of battery storage or energy storage as integrated clean energy and GHG-reducing solutions, which can provide co-benefit of providing grid resilience).

★ **Measure Energy-4: Install backup batteries, generators, or microgrids at critical facilities (e.g., fire stations, hospitals, campuses), community resilience centers, or similar sheltering locations**

- ▶ Action Energy-4.1: Identify existing facilities that can serve as emergency shelters and ensure they have sufficient backup power using batteries or generators. Secure additional funding to conduct building improvements and enhance the resiliency of these facilities.
- ▶ Action Energy-4.2: Partner with MCE and explore the feasibility of microgrid installations and/or virtual power plant opportunities at local government agency-owned facilities, school or college campuses, hospital campuses, or other types of facilities where the use of microgrids or similar systems would be cost-effective and appropriate for supporting both energy grid and community resilience.

## 4 IMPLEMENTATION MATRIX FOR CLIMATE ADAPTATION STRATEGIES, MEASURES, AND ACTIONS

The following table serves as a preliminary implementation matrix demonstrating the various components and implementation details to implement climate adaptation strategies, measures, and actions. Measure All-1 is used as an example. Once the County team provides comments and direction on the content and format of this table, Ascent will provide implementation details on all the adaptation strategies, measures, and actions. Some details (e.g., cost and funding) will be based on analyses prepared by our subconsultants later in the planning process.

The components and implementation details that Ascent proposes for the implementation matrix include:

- ▶ Strategy No. & Description: numbers and descriptions of adaptation strategies;
- ▶ Measure No. & Description: numbers and descriptions of adaptation measures;
- ▶ Action No. & Description: numbers and descriptions of adaptation actions;
- ▶ Primary Responsible Jurisdictions & Agencies: jurisdictions and agencies identified to implement a certain adaptation action/measure;
- ▶ Estimated Cost: estimated cost for a certain adaptation action/measure, which can be broad ranges such as "<\$10,000", "\$10,000 - \$100,000" and ">100,000";
- ▶ Time Frame: estimated time frame for a certain adaptation action/measure, which can be a specific time frame such as "3-5 years", or "ongoing" for ongoing actions/measures, or "annual implementation" for actions and measures that are implemented on an annual basis;
- ▶ Potential Funding Sources: potential funding sources identified for a certain adaptation action/measure, such as federal grants and/or general funds; and
- ▶ Priority: the priority of a certain adaptation action/measure in terms of importance, which can be "high," "medium," or "low." Prioritizing adaptation actions/measures helps the County and incorporated jurisdictions decide which to implement in the near term, given their benefits and importance.

**Table 1 Preliminary Implementation Matrix for Climate Adaptation Strategies, Measures, and Actions**

Strategy No. & Description	Measure No. & Description	Action No. & Description	Primary Responsible Jurisdictions & Agencies	Time Frame	Estimated Cost	Potential Funding Sources	Priority
Strategy 1: Improve the County and Its Jurisdictions' Overall Climate Resilience.	Measure All-1: Implement and monitor the effectiveness of existing policies, actions, and measures identified in existing planning mechanisms, including but not limited to hazard mitigation plan(s), and general plan safety elements.	Action All-1.1: Collaborate among departments and jurisdictions to ensure progress is being made on actions and measures already proposed in existing planning mechanisms.	County & All Jurisdictions	Ongoing	<i>[Jacobs Engineering will provide cost estimates for up to 10 adaptation measures. Cost analysis will begin following completion of draft measures.]</i>	FEMA & Other Federal Grants & Funding Sources	High
		Action All-1.2: Adhere to the monitoring, evaluating, and updating process proposed in the County's MJHMP and the City of Napa's LHMP to ensure progress is being made on proposed hazard mitigation actions, especially those rated to have extreme and high priorities during the hazard mitigation planning processes. Make changes and updates to these actions if necessary.	County & All Jurisdictions	Ongoing		General Fund	High

Source: Ascent 2024.

## 5 ATTACHMENT 1: MATRIX OF EXISTING REGIONAL HAZARD MITIGATION AND GENERAL PLAN SAFETY ELEMENT ACTIONS AND MEASURES