

**Attachment 11.1 – Supporting Documents**

**Program Preferences**

**Madera Region – IRWM Implementation Grant Application**

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## **Attachment 11.1, Program Preferences**

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## Attachment 11 .1 – Program Preferences

The proposed programs, individually and collectively, meet the following program preferences:

### 1. Regional Projects and Programs

Two of the major goals of the Madera IRWMP are to mitigate flood hazards and manage groundwater so as to maximize beneficial water use and reduce the groundwater overdraft. All of the proposed projects will help to meet these goals on a regional basis as follows.

a. Flood Hazard Reduction - The Arundo eradication and sediment removal projects increase flood flow capacities and reduce flooding hazards in the north and west portions of the region. The In Lieu Recharge project will divert San Joaquin River flood flows and reduce peak discharges in the San Joaquin River. Lastly, the Forest Service fuel reduction project prevents the conditions that lead to floods and debris flows in the east (foothill) part of the region.

b. Groundwater management to reduce overdraft – The Arundo eradication projects increase water supply for groundwater recharge by reducing the excessive evapotranspiration of water, allowing this water to percolate through the permeable stream and slough beds and recharge the groundwater basins. The in lieu recharge project directly addresses groundwater overdraft by supplying surface water to replace groundwater pumping. The fuel reduction project maintains the healthy forest soil system which filters and retains the region’s source waters, releasing them slowly for beneficial use instead of allowing overland flood flows that are contaminated with sediment and debris.

In addition, these projects are spatially located throughout the region, appropriately reflecting the collective impact on the underlying groundwater basin and the connectivity between upper and lower watersheds (see Regional Project Map, Attachment 11.1, page 17). Although proposed projects are located throughout the region in areas where their impacts are particularly needed, together they will have a synergistic effect which will benefit the entire region. Groundwater recharge may primarily benefit one area but ultimately impacts the entire basin’s resources. Fuels management directly benefits the forests and the residential areas immediately adjacent, but also impact surface water flows to the valley areas. The Madera Region is one of the few IRWM regions which contains both the valley and foothills including both water source and water use areas and reflecting the essential connectivity between upper and lower watersheds. Management of foothill and mountain forestlands directly impacts the quantity and quality of waters which flow to the valley for agricultural and urban uses. The choice of projects for this application reflects an appreciation of the need for projects throughout the region to address water management problems and challenges.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Ash Slough Eradication and Sand Removal Project
  - Attachment 7 narrative
  - Attachment 9 Flood Hazard Reduction analysis and backup documentation
- Cottonwood Creek, Dry Creek and Berenda Creek Arundo Eradication and Sand Removal Project
  - Attachment 7, sections:
    - Project Overview
    - With and Without Project
    - Areas Benefitted
  - Attachment 9, sections:
    - Narrative
    - FRAM analysis and backup documentation
- Root Creek In-Lieu Groundwater Recharge Project
  - Attachment 7, sections:
    - Project Overview
    - With and Without Project
    - Areas Benefitted
  - Attachment 8, sections:
    - With and Without Project
    - Areas Benefitted
    - Non-quantifiable Economic Benefits
    - Groundwater Quality Benefits
    - Groundwater Quality vs. Depth
  - Attachment 9, sections:
    - Water Supplies
    - With and Without Project
    - Area Benefitted
- Sierra National Forest Fuel Reduction Project
  - Attachment 9 analysis and backup documentation

## **2. Integrating Water Management with Land Use Planning**

Water management in the Madera region is challenged by related phenomena – the decline of groundwater levels due to overdraft and pressures for development in the very areas where groundwater level declines are the greatest. The proposed Root Creek Water District In-Lieu Recharge project will provide surface water supplies to replace groundwater pumping for new future residential developments as well as for agricultural use. Currently and in the foreseeable future, this portion of the Madera Region will be a focus of the County’s development (see Attachment 11.1, page 21).

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Root Creek In-Lieu Groundwater Recharge Project
  - Attachment 7, sections:
    - Areas Benefitted
    - Attachment 7.4, Surface Water Contracts

### 3. Contribute to the attainment of one or more objectives of the CALFED Bay-Delta Program

The proposed projects contribute to the following Bay-Delta Program Objectives:

a. Ecosystem Restoration: This objective will be met in two ways:

1. The four waterways where *Arundo donax* eradication and sediment removal will have improved flood flows. This will reduce the amount of erosion and sedimentation, thus improving water quality. In addition, removal of invasive plant species will allow for native vegetation to establish itself and provide food and cover for wildlife, particularly species of concern. Increasing wildlife habitat, increasing water availability, reducing erosion, and enhancing water quality will meet the program's goal of Ecosystem Restoration.
2. The Fuels project will enhance and restore the ecosystem of the upper watershed, both by improving forest health and by preventing ecosystem destruction due to catastrophic wildfires. High severity wildfires can leave a watershed completely devoid of vegetation and ground cover. High surface temperatures during a fire can also cause physical, chemical, and biological changes to soils that reduce infiltration and make them more susceptible to erosion. The proposed treatments will increase forest health and vigor, leading to long term water quality and quantity benefits. Healthy fire-resistant watersheds are resilient to disturbances such as drought and disease, and will continue to provide high quality water through the natural filtering and slow release of water through subsurface flow.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Ash Slough Eradication and Sediment Removal Project
  - Section 8 narrative and documentation
- Cottonwood Creek, Dry Creek and Berenda Creek *Arundo* Eradication and Sediment Removal Project
  - Section 8 narrative and documentation
- Sierra National Forest Fuel Reduction Project
  - Section 8 narrative and documentation

b. Water Supply Reliability: The proposed projects will increase water supply reliability through:

1. Reducing groundwater overdraft. The proposed *Arundo* eradication projects address the groundwater overdraft by reducing the excessive evapotranspiration in waterways and the Root Creek project by providing in-lieu recharge through importing of surface water supplies. A majority of the water supply for the valley portion of the region is dependent on groundwater. The current overdraft threatens water supply reliability – if the problem is not reversed then pumping restrictions will be inevitable. More directly,

declining groundwater levels threaten water supply by dropping current rural residential and municipal well levels.

2. Improving upper watershed hydrologic functions. Healthy fire-resistant watersheds are resilient to disturbances such as fire and drought and will continue to provide high quality water through the natural filtering and slow release of water through subsurface flow. This makes more water available for storage and use since reservoir storage is not overwhelmed by the concentrated run-off which occurs during storm events and from snowmelt. The Madera IRWM recognizes this (see page 8-31) and cites Kattelman et al., (1983) "Given the state of reservoir capacity in California, delaying streamflow is perhaps the greatest contribution watershed management can make to meeting future demands."

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Ash Slough Eradication and Sediment Removal Project
  - Section 7 text and documentation
- Cottonwood Creek, Dry Creek and Berenda Creek Arundo Eradication and Sediment Removal Project
  - Section 7 text and documentation
- Root Creek In-Lieu Groundwater Recharge Project
  - Attachment 7 – Economic Analysis – Water Supply Costs and Benefits
  - Attachment 8, sections:
    - Groundwater Quality Benefits
    - Groundwater Quality vs. Depth
- Sierra National Forest Fuel Reduction Project
  - Work plan narrative

#### 4. Statewide Priorities – The proposed program address the following Statewide Priorities

a. Drought Preparedness – The project addresses drought preparedness by:

- Decreasing water waste from Arundo evapotranspiration, making more water available for agricultural use and groundwater recharge.
- Increasing total water supplies (Root Creek Water District) by importing surface waters. It also helps assure the availability of groundwater by recharging it during wet years with section 215 and Class 2 water which would otherwise go unused.
- Overstocked forests are more susceptible to disturbances (i.e. insect, disease, and fire) during periods of drought. The proposed project will reduce stand density and competition for water making the entire upper watershed more drought-resistant. This improvement in the health of the forest will help preserve the area's essential ecosystem and hydrologic functions.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Ash Slough Eradication and Sediment Removal Project
  - Attachment 7 narrative and documentation
- Cottonwood Creek, Dry Creek and Berenda Creek Arundo Eradication and Sediment Removal Project
  - Attachment 7 narrative and documentation
- Root Creek In-Lieu Groundwater Recharge Project
  - Attachment 3, sections:
    - I.A. Introduction
  - Attachment 7, sections:
    - Project Overview
    - Water Supplies
    - With and Without Project
    - Areas Benefitted
  - Attachment 8, sections:
    - With and Without Project
    - Areas Benefitted
    - Non-quantifiable Economic Benefits
    - Groundwater Quality Benefits
    - Groundwater Quality vs. Depth
  - Attachment 9, sections:
    - Water Supplies
    - With and Without Project
    - Area Benefitted
- Sierra National Forest Fuel Reduction Project
  - Work plan section I – Project Introduction and documentation

#### **4. Statewide Priorities – The proposed program address the following Statewide Priorities**

b. Efficient Use of Water – The projects will improve agricultural water use efficiencies by reducing unnecessary evapotranspiration by *Arundo donax* in the Cottonwood, Dry and Berenda creeks which the Madera Irrigation District uses for agriculture water deliveries. The Root Creek In-Lieu Groundwater Recharge Project will accept Section 215 Flood Water that would otherwise cause flood damage downstream of the project location or would leave the area unused.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Cottonwood Creek, Dry Creek and Berenda Creek Arundo Eradication and Sediment Removal Project
  - Work Plan Section I – Project Introduction
  - Attachment 7 Narrative and documentation
- Root Creek In-Lieu Groundwater Recharge Project
  - Attachment 9, sections - water Supplies

#### **4. Statewide Priorities – The proposed program address the following Statewide Priorities**

c. Climate Change Response – This priority is met in two ways:

- GHG emission reduction/water system energy efficiency – The Root Creek in-lieu recharge project will make available surface water delivery possible to areas that are now dependent on groundwater pumping. The reduced pumping will save an estimated 1.2 million KW hours/year. These represent a reduction of the greenhouse gasses produced through the generation of this electrical energy.
- The Forest Service Fuel reduction project provides a climate change mitigation through reducing the probability of severe wildfires – something which has increased (and will continue to increase) due to climate change.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Root Creek In-Lieu Groundwater Recharge Project
  - Attachment 8, sections - Reduction in Groundwater Pumping Costs, Attachment 8.4, page 3.
- Sierra National Forest Fuel Reduction Project
  - Work Plan Section I – Project Introduction

#### 4. Statewide Priorities – The proposed program address the following Statewide Priorities

##### d. Expand Environmental Stewardship –

- The Ash Slough and Cottonwood, Dry and Berenda Creek projects restore riparian habitat in 28 miles of local waterways by removing *Arundo Donax*. *Arundo* grows so thickly that it chokes out habitat for birds and mammals. Since it lacks a canopy, it also reduces waterway shading leading to hotter water temperatures, which can harm habitat for insects. Removal of the invasive infestation will allow for native vegetation to establish itself and provide food and cover for wildlife. Increasing the acreage of native vegetation will result in a net increase in habitat for many species, both migratory and resident, including the following several special status species that have been found in the sloughs:
  - *Western Yellow-billed cuckoo (Coccyzus americanus occidentalis)*, a federal candidate species
  - Southwestern willow flycatcher (*Empidonax traillii extimus*) a state and federally endangered species
  - Least Bell's vireo (*Vireo bellii pusillus*), a state and federally endangered species
  - Swainson's hawk (*Buteo swainsonii*), a state threatened species.
- The Forest Service project protects vital ecosystem functions in the region's upper watersheds. Thinned plantations will not only reduce fuel loading but will also promote tree growth thereby increasing habitat quality. The decrease in severe wildfires also protects the area's waterways from debris flows and harmful siltation.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Ash Slough Eradication and Sand Removal Project
  - Attachment 8 and documentation
- Cottonwood Creek, Dry Creek and Berenda Creek Arundo Eradication and Sand Removal Project
  - Attachment 8 and documentation
- Sierra National Forest Fuel Reduction Project
  - Work Plan Introduction
  - Attachment 8 and documentation

#### **4. Statewide Priorities – The proposed program address the following Statewide Priorities**

e. Integrated Flood Management - This Statewide Priority will be met by the Ash Slough, Cottonwood, Dry, and Berenda Creek projects. These projects will reduce flood hazards by restoring hydraulic and hydrologic stream functions in the waterways, and reducing flood hazards while improving the riparian ecosystems. The Root Creek project will help decrease flooding on the San Joaquin River by diverting and using floodwaters for irrigation. The project will harness local high flows and convert them into dependable supply. The Forest Service project will also reduce flood hazards through excess fuel reduction which prevents severe wildfire at the same time it improves the ecosystem health.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Ash Slough Eradication and Sediment Removal Project
  - Attachment 8 and documentation
  - Attachment 9 and documentation
- Cottonwood Creek, Dry Creek and Berenda Creek Arundo Eradication and Sediment Removal Project
  - Attachment 8 and documentation
  - Attachment 9 and documentation
- Root Creek In-Lieu Groundwater Recharge Project
  - Attachment 9 – Economic Analysis - Flood Damage Reduction Costs and Benefits.
- Sierra National Forest Fuel Reduction Project
  - Work Plan Introduction
  - Attachment 8 and documentation
  - Attachment 9 and documentation

#### 4. Statewide Priorities – The proposed program address the following Statewide Priorities

f. Protect Surface and Groundwater Quality - Surface and groundwater quality will be protected as follows:

- The water quality in Ash Slough, Cottonwood, Dry and Berenda Creeks will be improved through removal of *Arundo donax* which chokes out native vegetation, including trees. Since it is without canopy, this results in higher water temperatures, which reduce habitat value for riparian species. Also, the projects help reduce the frequency of flood events, and when flood-flows retreat from upper elevations, they carry with them invasive plant seed, sediment, nutrients, and other harmful elements. Flood flows from these waterways impact downstream waters, including the San Joaquin River and the Delta.
- The Root Creek in-lieu recharge project will improve groundwater quality through importing high quality surface water that will mix with the groundwater and improve its overall quality. The project will also help to maintain existing groundwater levels in an area where groundwater quality is known to worsen with depth.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Ash Slough Eradication and Sediment Removal Project
  - Attachment 8 and documentation
- Cottonwood Creek, Dry Creek and Berenda Creek Arundo Eradication and Sediment Removal Project
  - Attachment 8 and documentation
- Root Creek In-Lieu Groundwater Recharge Project
  - Attachment 8.4 section
    - Groundwater Quality vs. Depth
    - Attachment 8.4 page 11 – groundwater quality test results.
- Sierra National Forest Fuel Reduction Project
  - Work Plan Introduction
  - Attachment 8 and documentation

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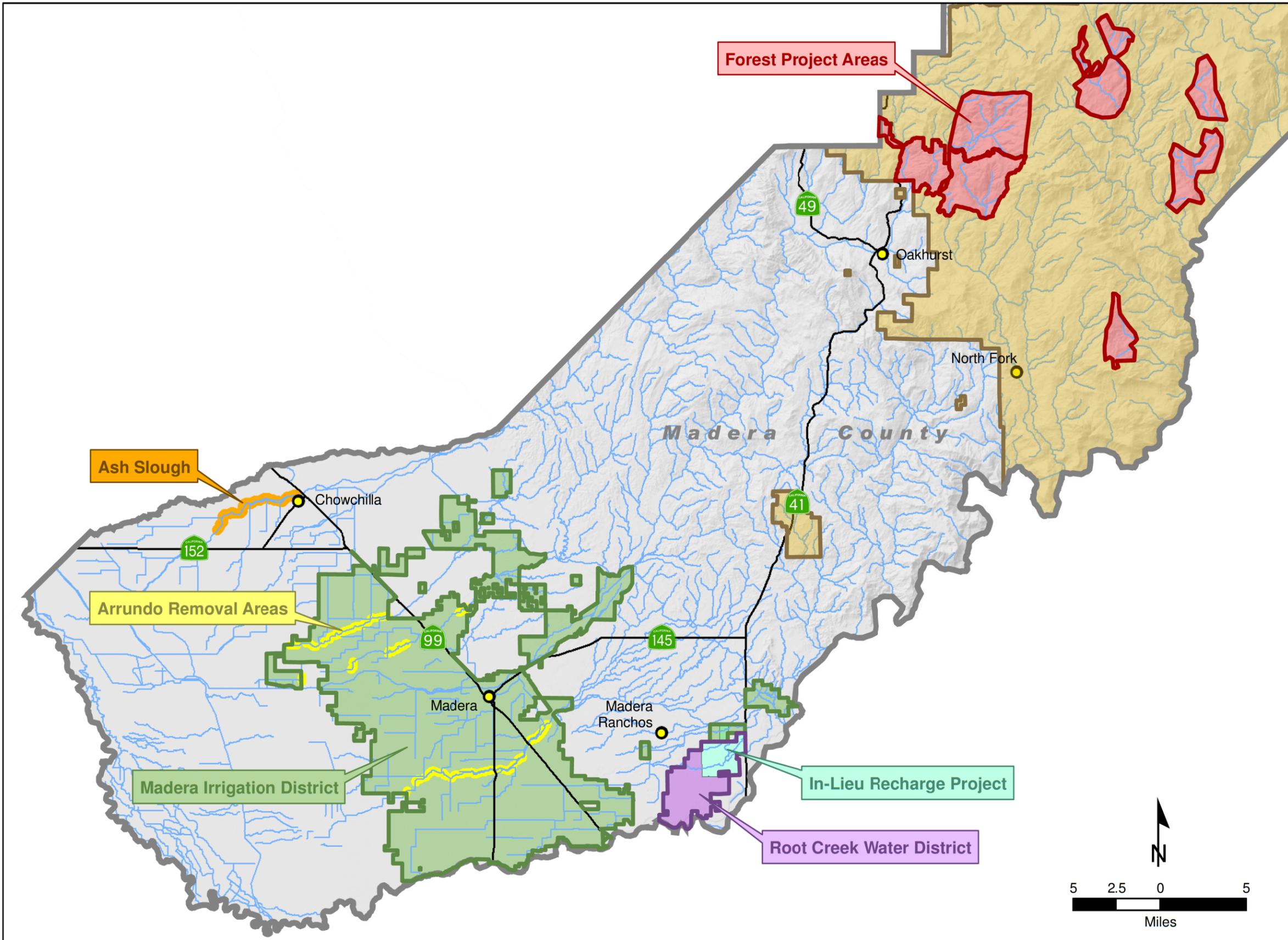
**Attachment 11.1, Regional Project Map**

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# Madera Regional Water Management Group

## Attachment 11.1 Project Locations

- Root Creek Water District
- Madera Irrigation District
- Sierra National Forest
- USFS Project Areas
- Arrundo Removal Areas
- Ash Slough Project
- In-Lieu Recharge Project



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**Attachment 11.1, Map of Madera Region Proposed Developments**

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# Projects in Progress

## ADDITIONAL PROJECTS:

### SOUTHEAST AREA PLAN

Five major proposals have been proposed within the planning area in the past three years. Three of the proposals are large enough in size to become standalone communities, with a full array of urban services. The Area Plan is a tool to provide solutions to the potential impacts of proposed development. It will be an action plan to deal with many different environmental constraints from a cumulative perspective.

### SOLAR ORDINANCE

To include the definition of a commercial solar farm. It is important to note that several types of solar power-generating facilities currently exist. These include solar dishes, solar power towers, and photovoltaic (typical solar panels) systems. The definition is crafted to allow all existing and future systems.

### NOISE ELEMENT

(State Law Section 65302f) - Adopted October 24, 1995 as a part of the overall GP update done in 1995. Modification was just completed.

### AIR QUALITY ELEMENT

(State Law Section 65302.1) - In Process - The Plan is to contain "a fundamental shift in priorities from emphasis on mobility for the occupants of private automobiles to a multi model system more efficient uses of scarce resources. It requires a change in attitude from the public to support development patterns and transportation systems different from the status quo. The new element will require a review of all other elements for consistency.

### GENERAL PLAN LAND USE ELEMENT

(State Law Section 65302a) - Adopted October 24, 1995 as a part of the overall GP update. Update is currently underway.

### MADERA COUNTY HIGHWAY CORRIDOR DESIGN GUIDELINES

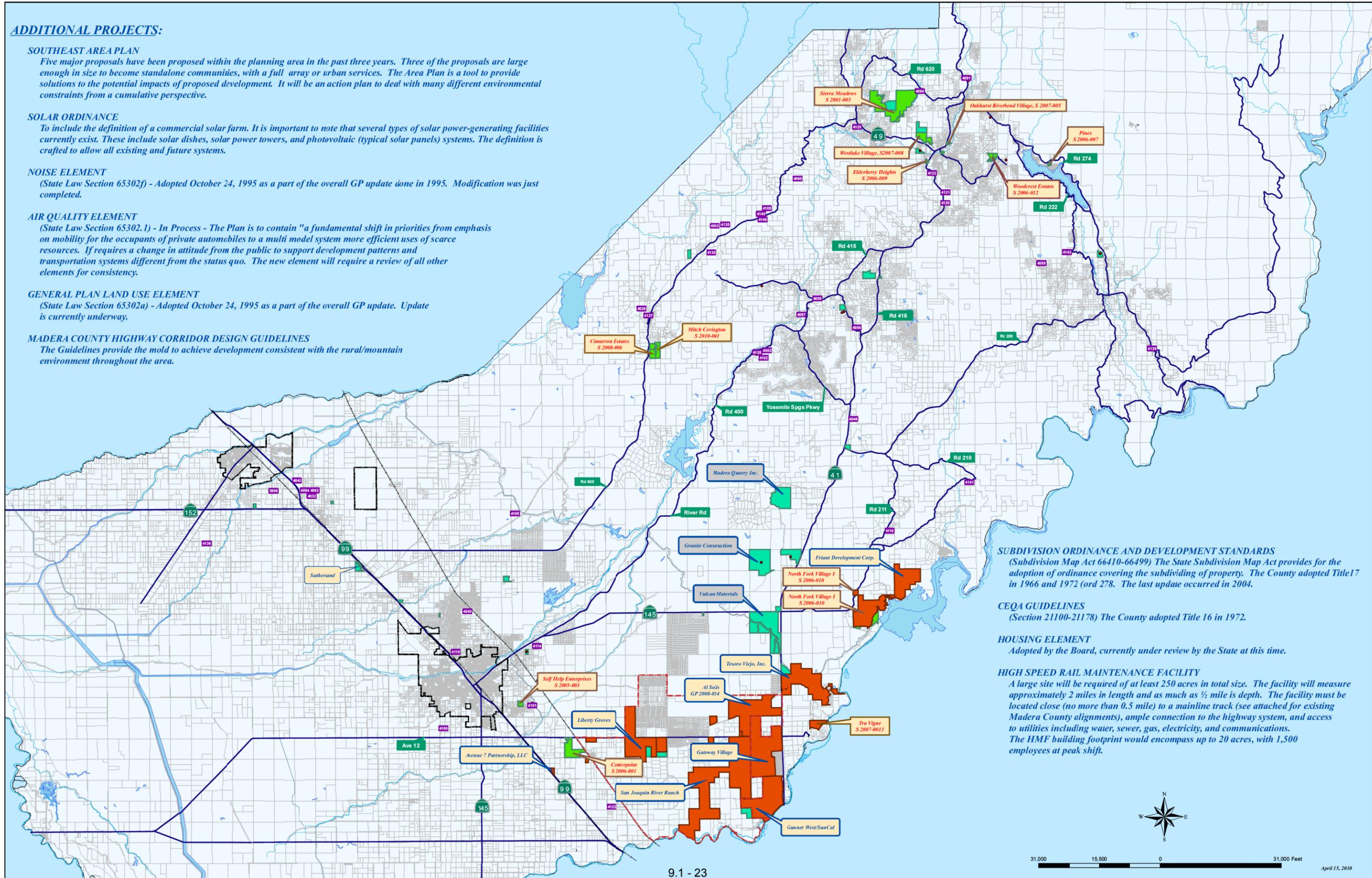
The Guidelines provide the mold to achieve development consistent with the rural/mountain environment throughout the area.

**SUBDIVISION ORDINANCE AND DEVELOPMENT STANDARDS**  
(Subdivision Map Act 66410-66499) The State Subdivision Map Act provides for the adoption of ordinance covering the subdividing of property. The County adopted Title 17 in 1966 and 1972 (ord 278. The last update occurred in 2004.

**CEQA GUIDELINES**  
(Section 21100-21178) The County adopted Title 16 in 1972.

**HOUSING ELEMENT**  
Adopted by the Board, currently under review by the State at this time.

**HIGH SPEED RAIL MAINTENANCE FACILITY**  
A large site will be required of at least 250 acres in total size. The facility will measure approximately 2 miles in length and as much as 1/2 mile in depth. The facility must be located close (no more than 0.5 mile) to a mainline track (see attached for existing Madera County alignments), ample connection to the highway system, and access to utilities including water, sewer, gas, electricity, and communications. The HMF building footprint would encompass up to 20 acres, with 1,500 employees at peak shift.



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