

Upper Petaluma River Watershed Flood Control Project



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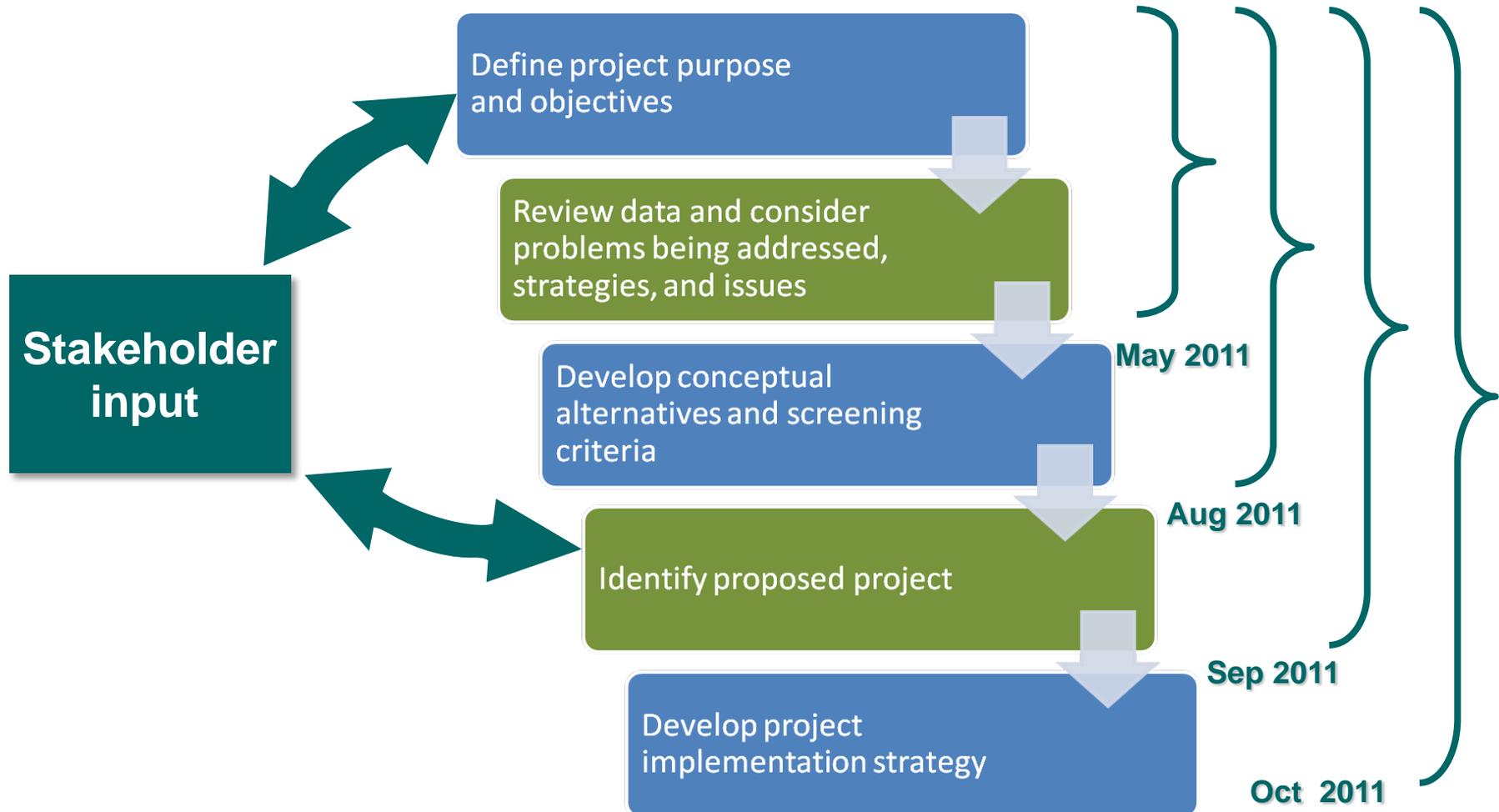
Meeting Agenda

- A. Greetings and Introduction
- B. Overview of the Scoping Study
- C. Issues and Needs within the Upper Petaluma River Watershed
- D. Review of Draft Objectives
- E. Potential Project Concepts
- F. Small Group Break-Out Session
- G. Next Steps

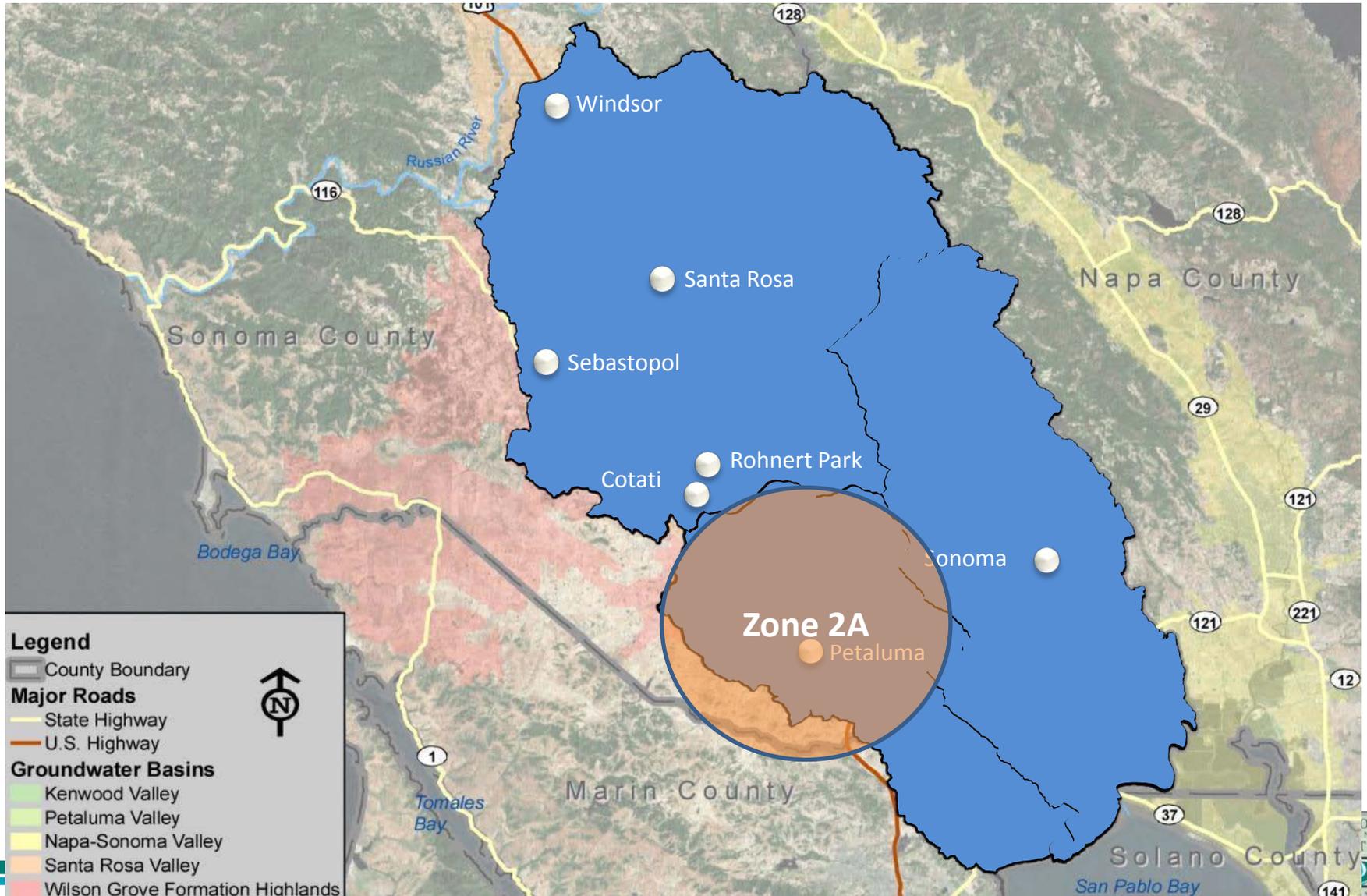
Core Project Objectives

- Flood hazard reduction
 - Improve management of stormwater that contributes, directly or indirectly, to reduced flood hazards.
- Groundwater recharge
 - Increase beneficial recharge of groundwater, whether or not that recharged groundwater is directly accessible as water supply.

Project Schedule

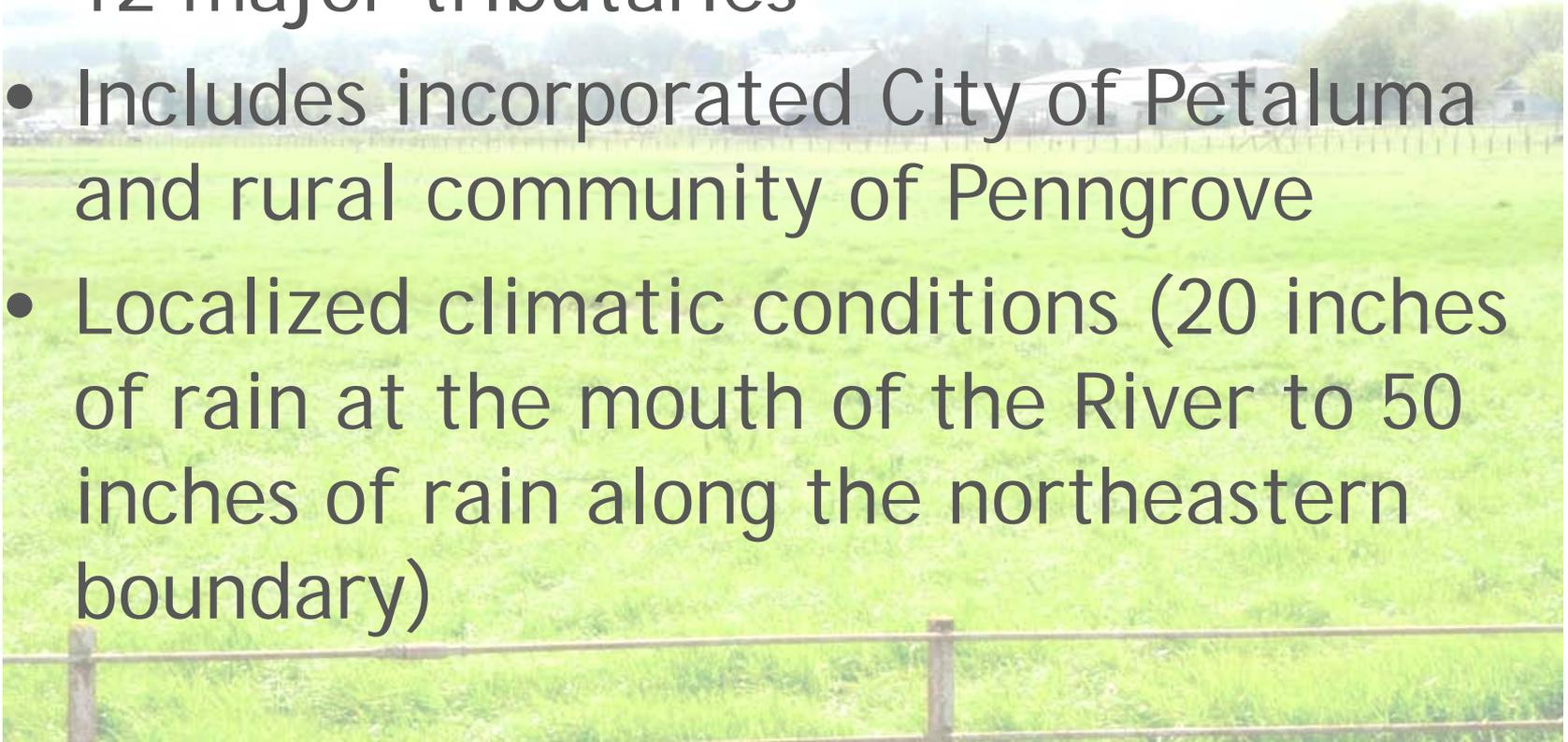


Scoping Study - Three Watersheds



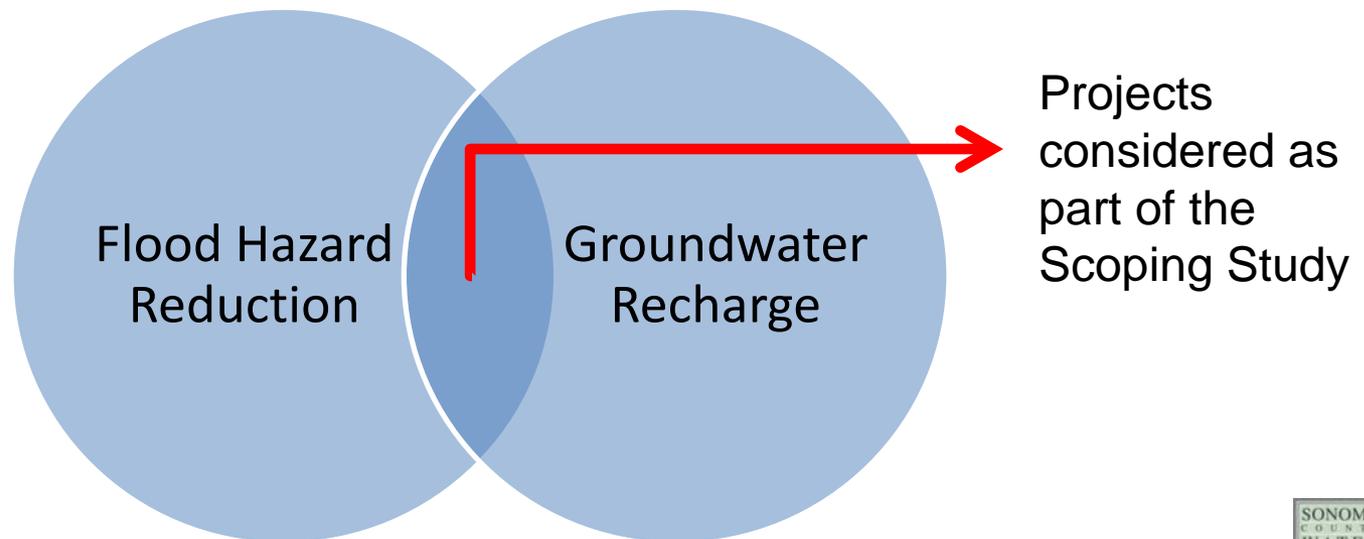
Zone 2A Watershed Overview

- 87 square miles
- 12 major tributaries
- Includes incorporated City of Petaluma and rural community of Penngrove
- Localized climatic conditions (20 inches of rain at the mouth of the River to 50 inches of rain along the northeastern boundary)

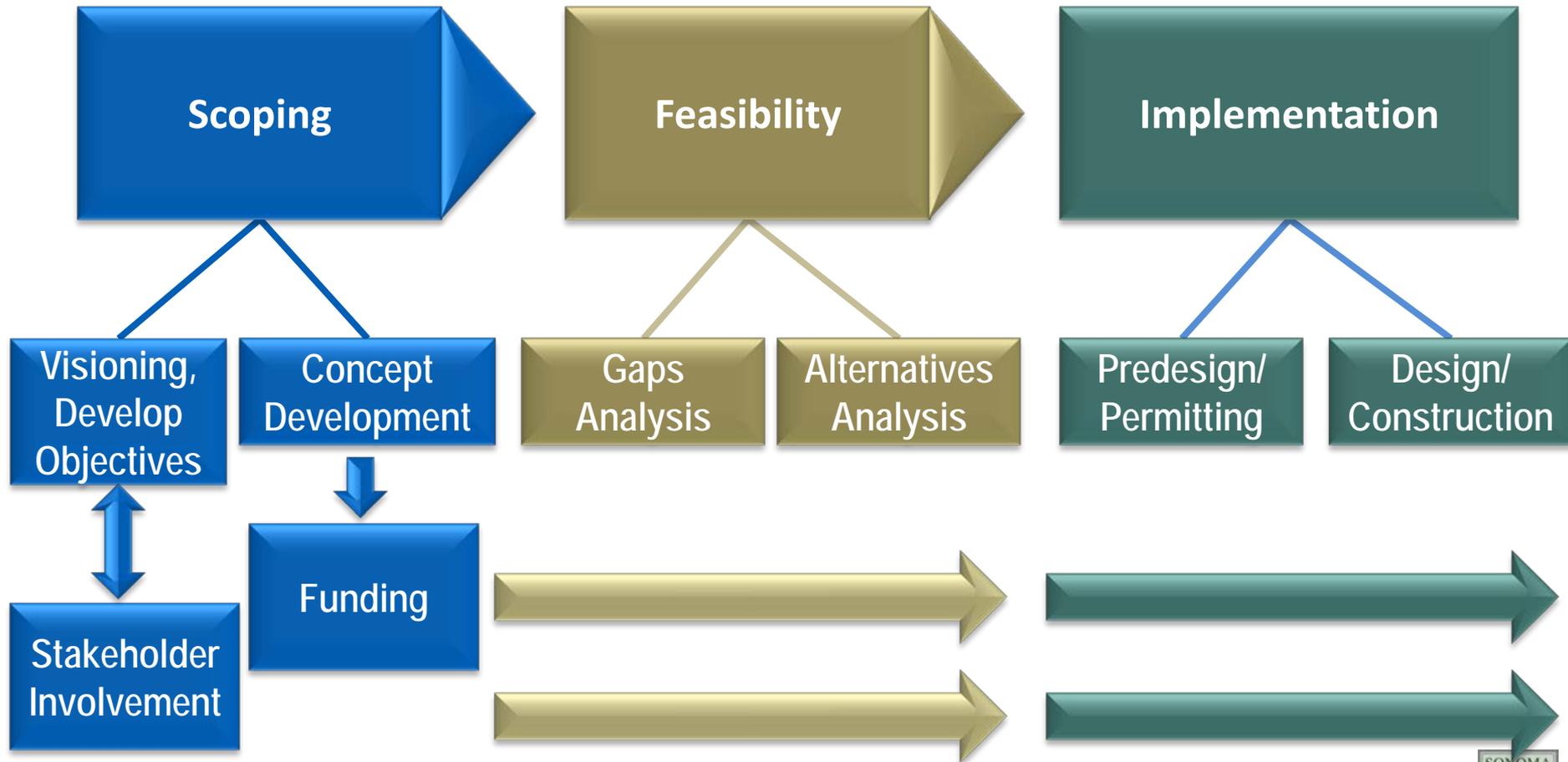


Key Project Purpose

- *Develop a stormwater management/groundwater recharge project(s) that will provide regional flood hazard reduction and groundwater benefits within the Upper Petaluma River Watershed.*



Planned Process - Phases of Work



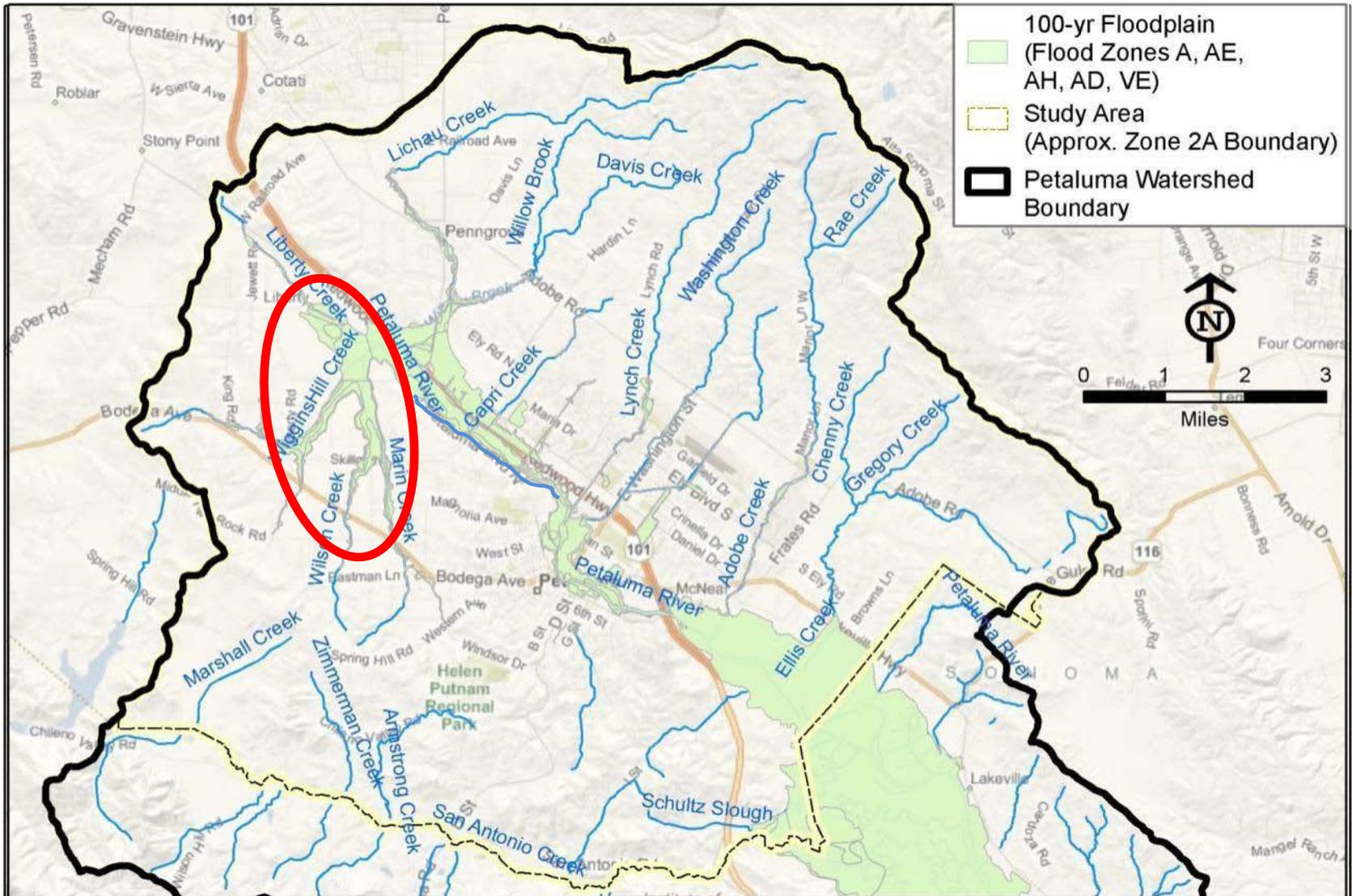
Issues Assessment

Overarching Issues - Similar to Other Watersheds

- Objectives Definition/Prioritization
- Watershed Understanding
- Stakeholder Coordination
- Project Integration
- Regulatory Constraints
- Funding Identification
- Effective Communication



Watershed Issues - Flooding



Marin and Wiggins Creek Watershed

- 11.2 square miles
- Elevation range 558 ft - 28 ft
- Average rainfall 25-30 inches
- Upper portions steep, lower portions flat (meandering channels, lower velocity, siltation, vegetation overgrowth)

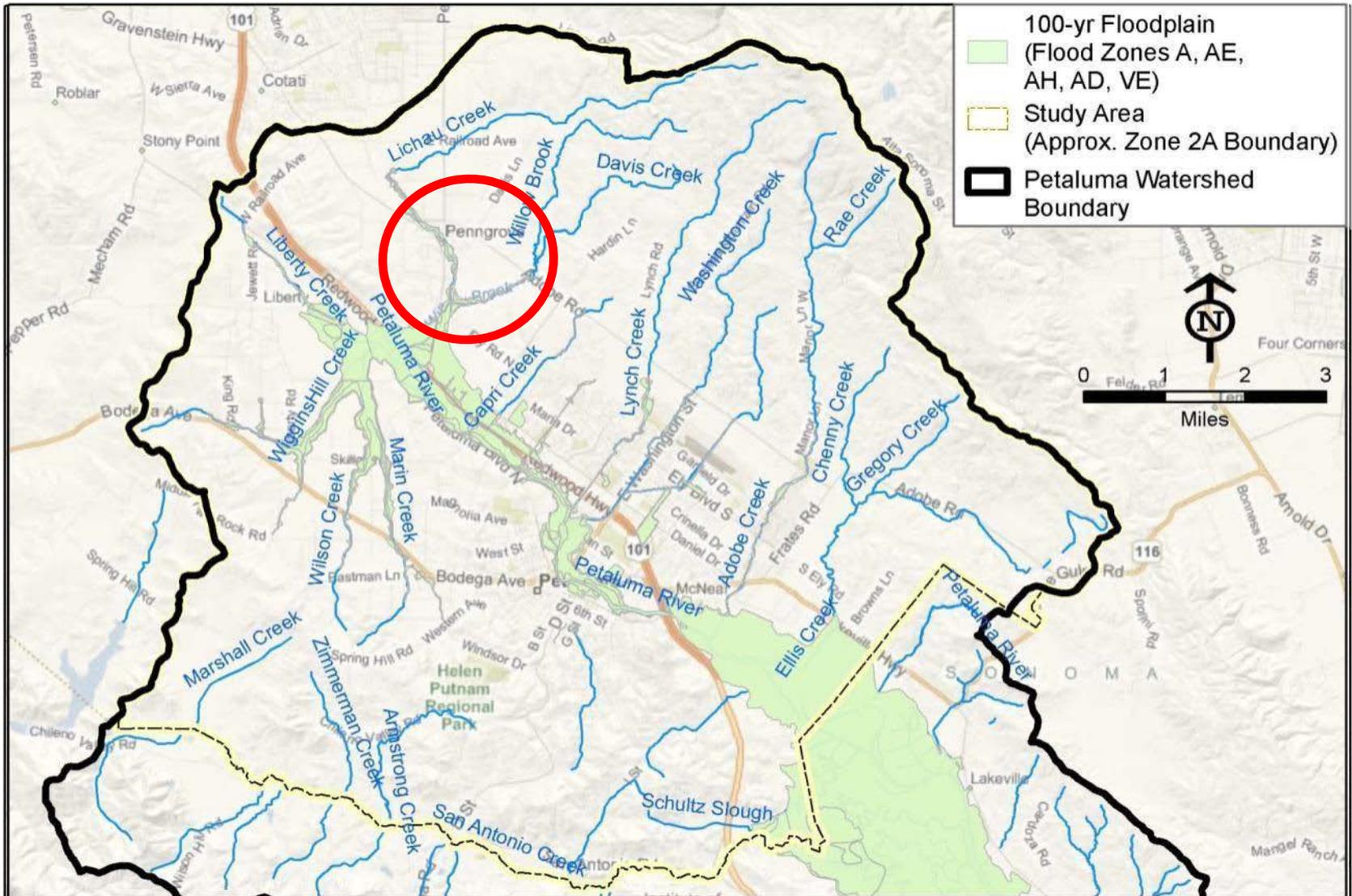
Marin Creek



Wilson Creek



Watershed Issues - Flooding



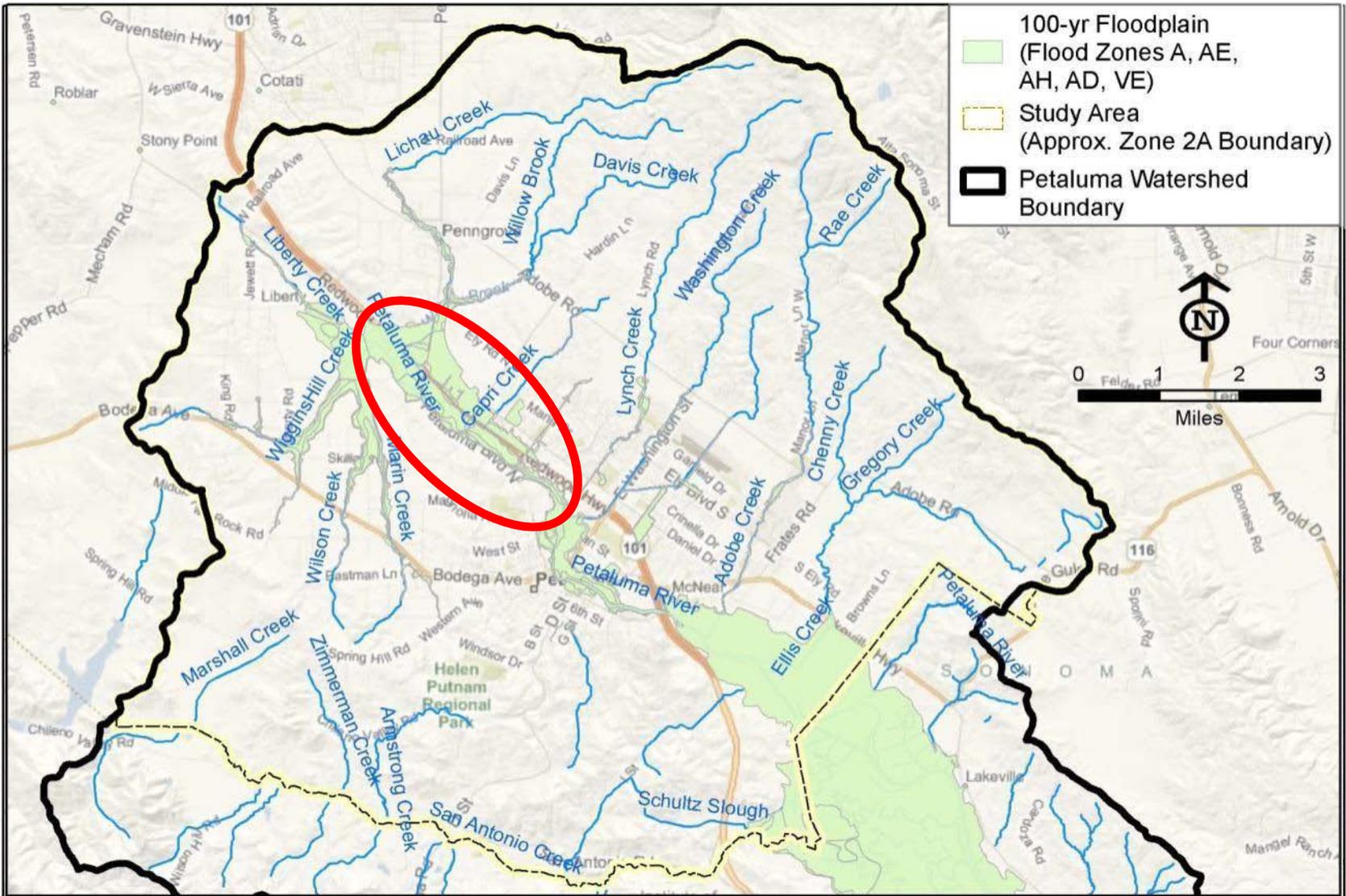
Downtown Penngrove Flooding



Erosion along Lichau Creek



Watershed Issues - Flooding



Denman Reach Terracing Project



Detention Basin at Lichau Creek



Petaluma Valley Groundwater Basin

- Petaluma Valley Basin - 46,000 acres
- Stratigraphy - faulted, discontinuous
- Well capacities relatively low
- Water quality inadequate in some areas for potable standards
 - High TDS
 - Iron, manganese
 - Nitrates

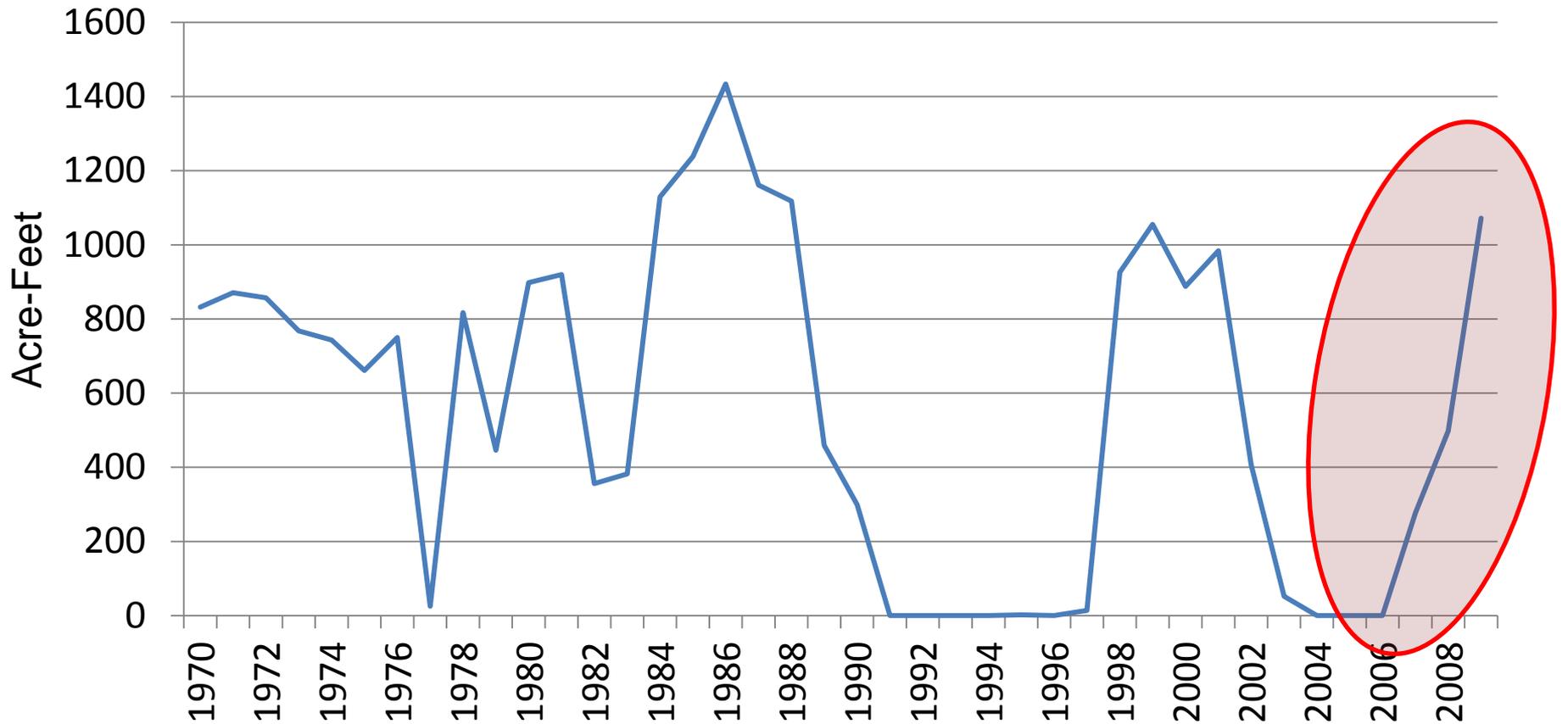
Groundwater Supply

- % of total supply from groundwater for City, 0-9%
- Estimated annual groundwater limit for City is 2000-3000 AF (past production ranges from 0-1,400 AFY)
- Pumping varies, but steadily increased from 2006

Reference: Petaluma 2005 UWMP

Increasing Use of Groundwater

City's Historical Groundwater Pumping (1970-2009)



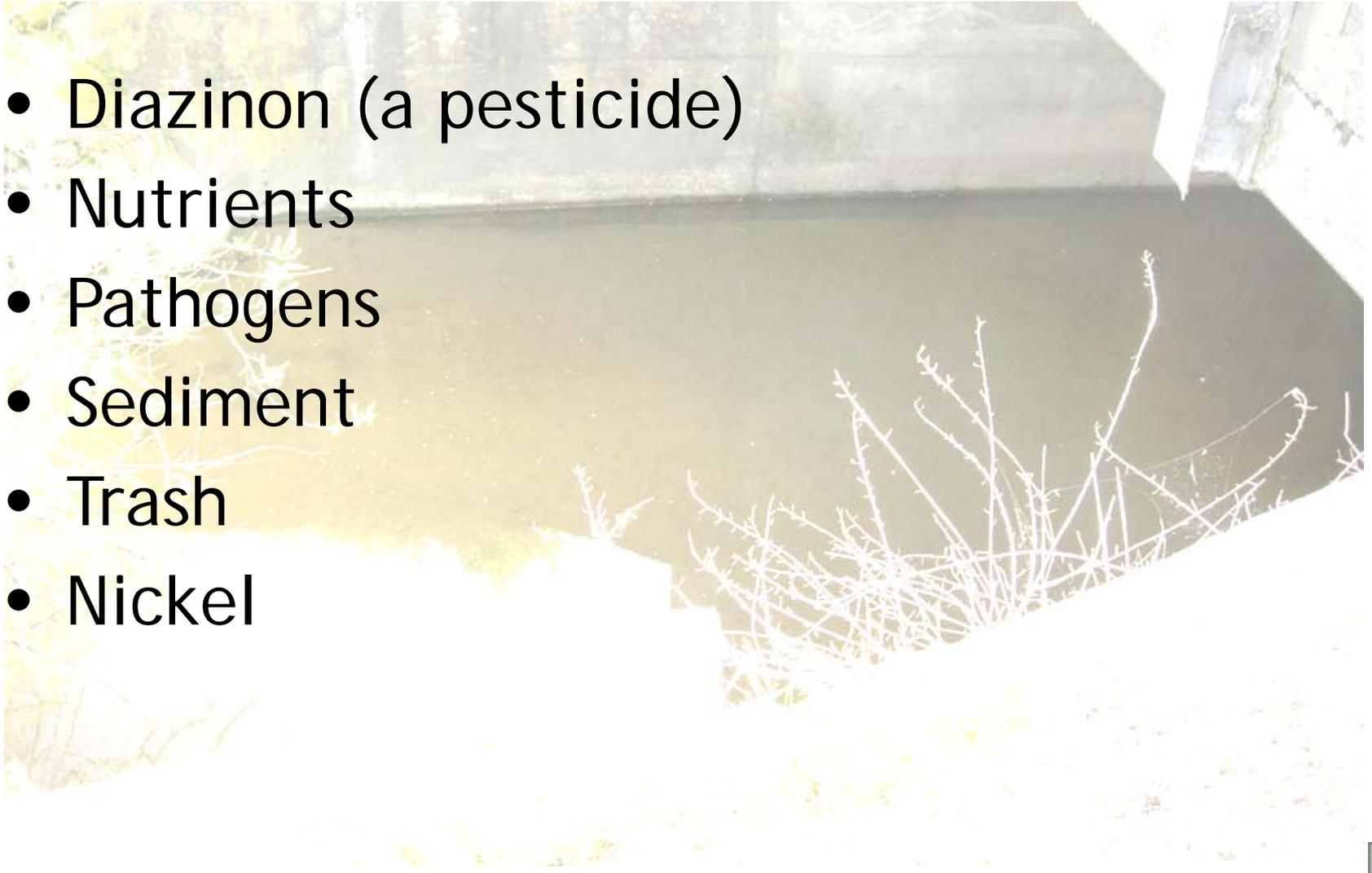
Groundwater Quality Issues

- Northwestern area - nitrates
 - Top 50 feet extending from surface affected*
 - Proposed projects should avoid mobilization
- Southeastern area - salinity
 - Seawater intrusion
 - Connate water from Sonoma Volcanics

* DWR Bulletin 118-4, 1982

Surface Water Quality Issues

- Diazinon (a pesticide)
- Nutrients
- Pathogens
- Sediment
- Trash
- Nickel



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Draft Core & Supporting Objectives

Flood Hazard Reduction
Groundwater Recharge

Water
Quality

Water
Supply

System
Sustain-
ability

Ecosystem

Agricult-
ural Land

Open
Space

Comm-
unity
Benefits

Draft Core Objectives

Core Objectives	Definition and Components
Flood Hazard Reduction	<p>Improve management of stormwater that contributes, directly or indirectly, to reduce flood hazards.</p> <ul style="list-style-type: none">A. Manage up to a 100-year storm eventB. Coordinate projects within and downstream of project areaC. Consider “green” methods
Groundwater Recharge	<p>Increase beneficial recharge of groundwater, whether or not that recharged groundwater is directly accessible as water supply.</p> <ul style="list-style-type: none">A. Provide rechargeB. Provide water supply offset from floods

Draft Supporting Objectives

Supporting Objectives	Definition and Components
Water Quality	<p>Protect or improve water quality of surface water and groundwater.</p> <ul style="list-style-type: none">A. Help eliminate impaired water body designationsB. Provide adequate water quality to sustain aquatic lifeC. Facilitate long-term operations & maintenance permittingD. Avoid aquifer degradationE. Improve aquifer water quality
Water Supply	<p>Increase or improve water supply availability, reliability and flexibility for domestic, municipal, industrial, agricultural and environmental use.</p> <ul style="list-style-type: none">A. Offset use of groundwater and potable surface water by utilizing storm flows

Draft Supporting Objectives

Supporting Objectives	Definition and Components
System Sustainability	<p>Support energy and water efficiency and climatic change resiliency of water management systems and developed supplies; provide for channel stability and sedimentation control; and consider the long-term viability of implemented project and impact on affected systems.</p> <ul style="list-style-type: none">A. Minimize use of imported energy at the project siteB. Ensure water is used efficientlyC. Implement improvements to mitigate effects of erosion and sedimentationD. Implement improvements that facilitate permitting for long-term O&M

Draft Supporting Objectives

Supporting Objectives	Definition and Components
Ecosystem	<p>Improve ecosystem function and/or enhance habitat, especially for listed species</p> <ul style="list-style-type: none">A. Integrate environmental habitat requirements into projectB. Promote sustainable, native habitats where possibleC. Preserve and enhance stream buffers and riparian areasD. Facilitate long-term O&M permitting
Agricultural Land	<p>Preserve agricultural land use</p> <ul style="list-style-type: none">A. Minimize use of agricultural landsB. Preserve and enhance agricultural lands

Draft Supporting Objectives

Supporting Objectives	Definition and Components
Open Space	Preserve and/or enhance open space. A. Minimize use of open space lands B. Preserve and enhance open space lands C. Restore degraded open space lands
Community Benefits	Create and/or enhance recreation, public access, education, etc. A. Provide educational opportunities B. Cooperate with local agencies to implement recreational features C. Protect or enhance visual resources

Draft Core & Supporting Objectives

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Groundwater Recharge

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Project Concepts- Multi-Benefit Approach



Stormwater Detention and Recharge Basin (In-Channel)



Off-Stream Detention Basin



Malibu Legacy Park – Recessed Detention Basin

Off-Stream Detention Basin



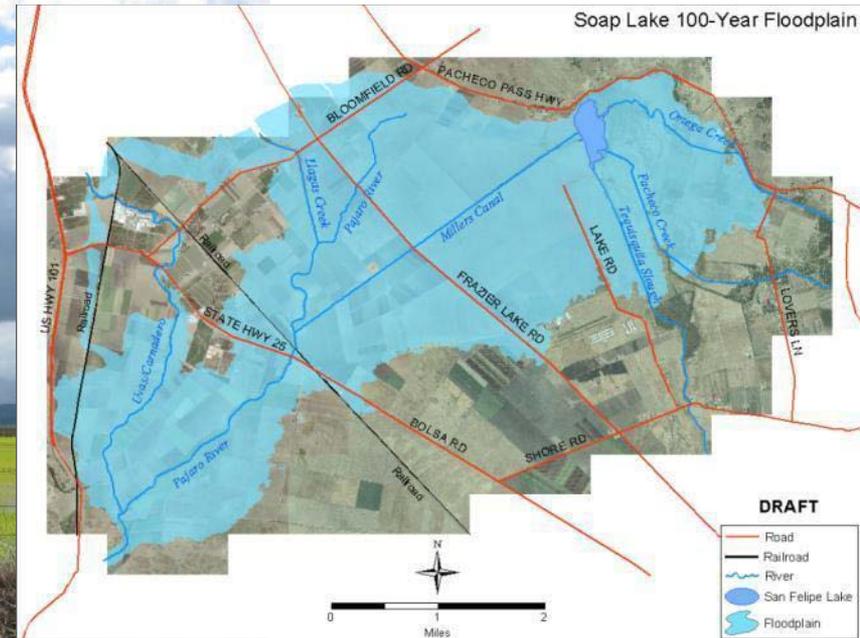
Malibu Legacy Park – Recessed Detention Basin

Underground Detention & Recharge Basin



Downey Discovery Sports Park - Detention with Infiltration

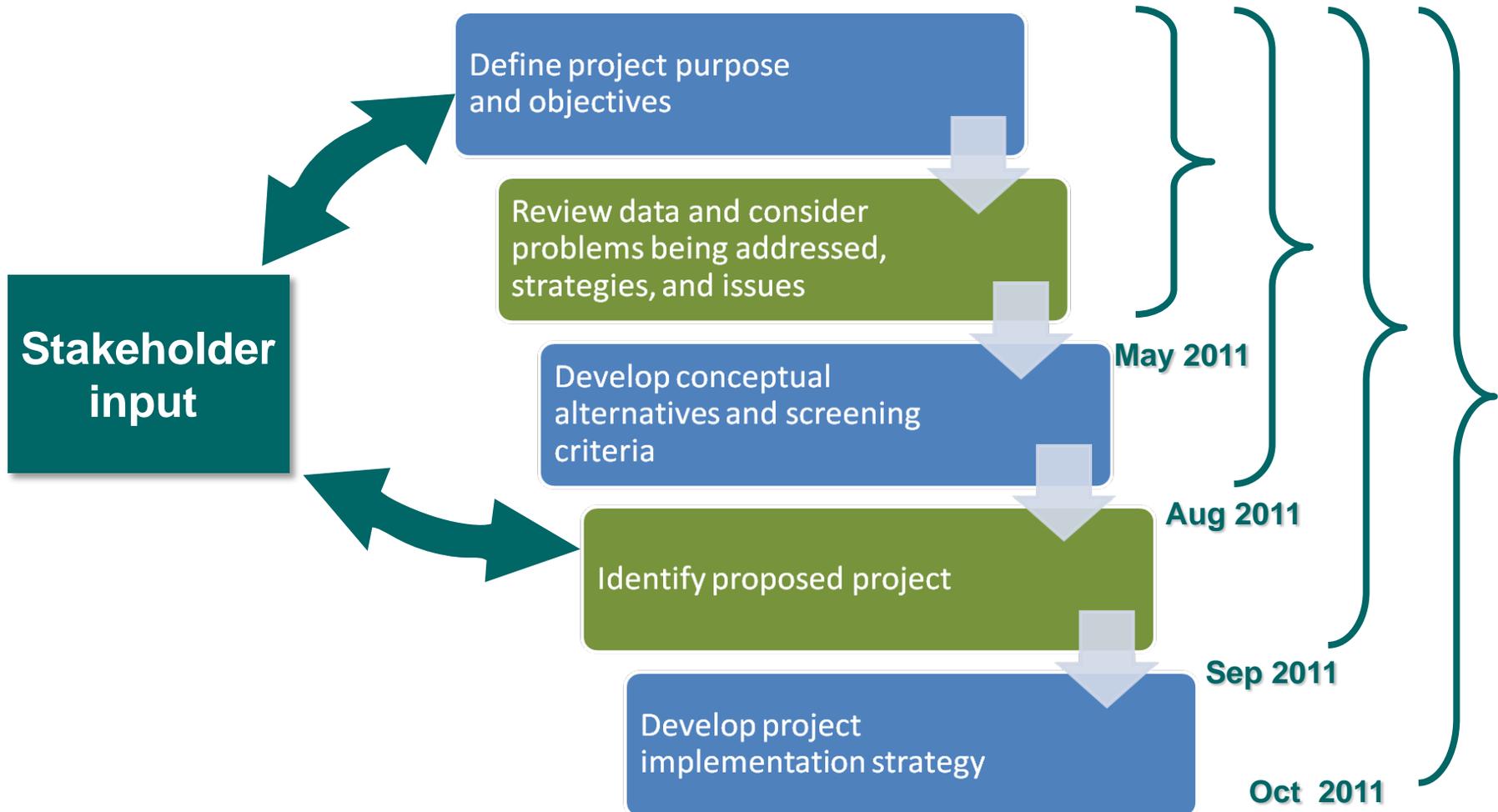
Managed Natural Floodplain



Small-Group Break Out Session

- 15 minutes
- Discuss relative importance of supporting project objectives
- Provide input on project concepts
- Designate one person per table to report back to group

Project Schedule/Next Steps



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