Upper Petaluma River Watershed Flood Control Project

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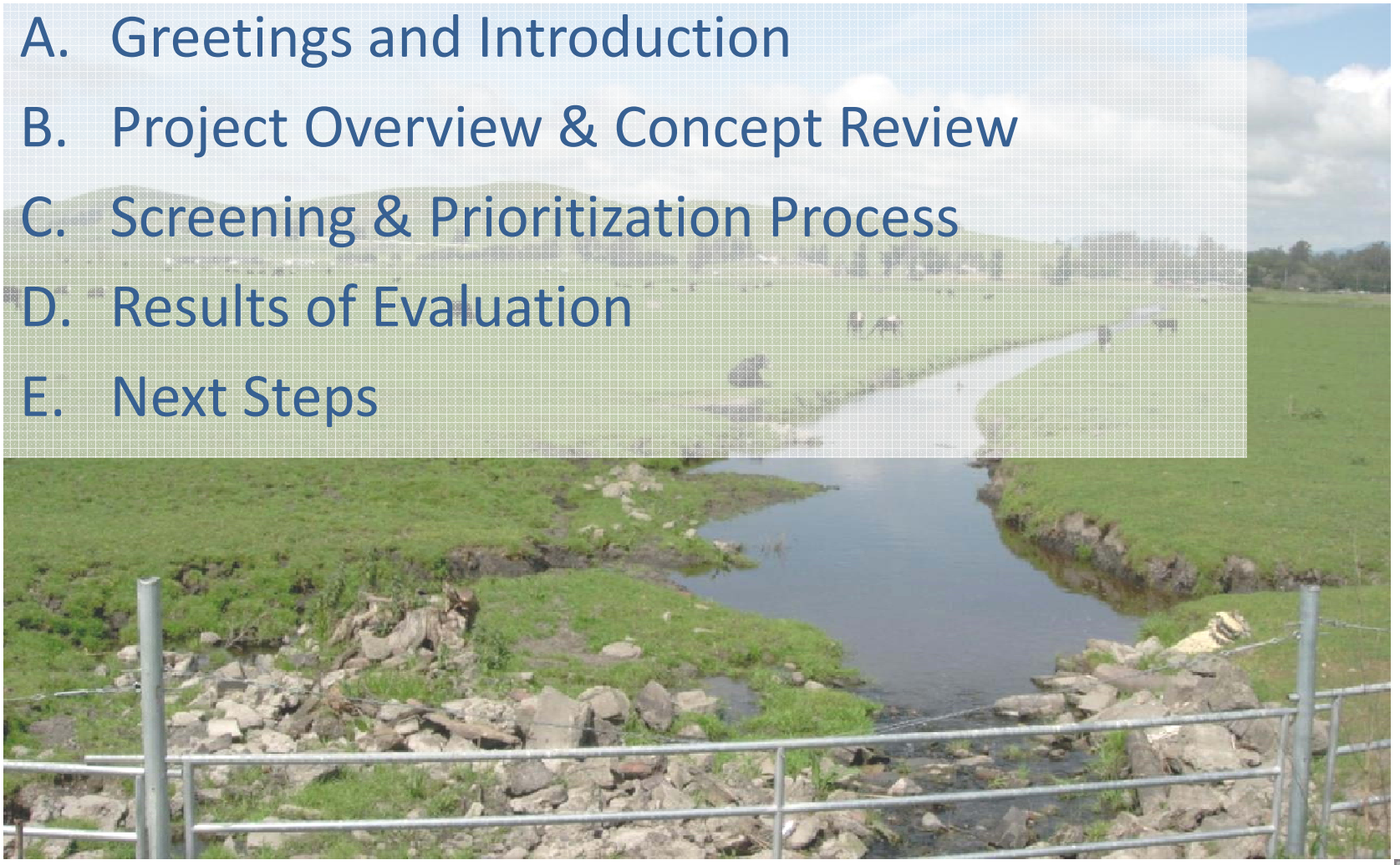
SONOMA COUNTY WATER AGENCY

www.sonomacountywater.org
www.scwa.ca.gov/stormwater-groundwater/

Presentation Agenda

A. Greetings and Introduction
B. Project Overview & Concept Review
C. Screening & Prioritization Process
D. Results of Evaluation
E. Next Steps



Presentation Purpose

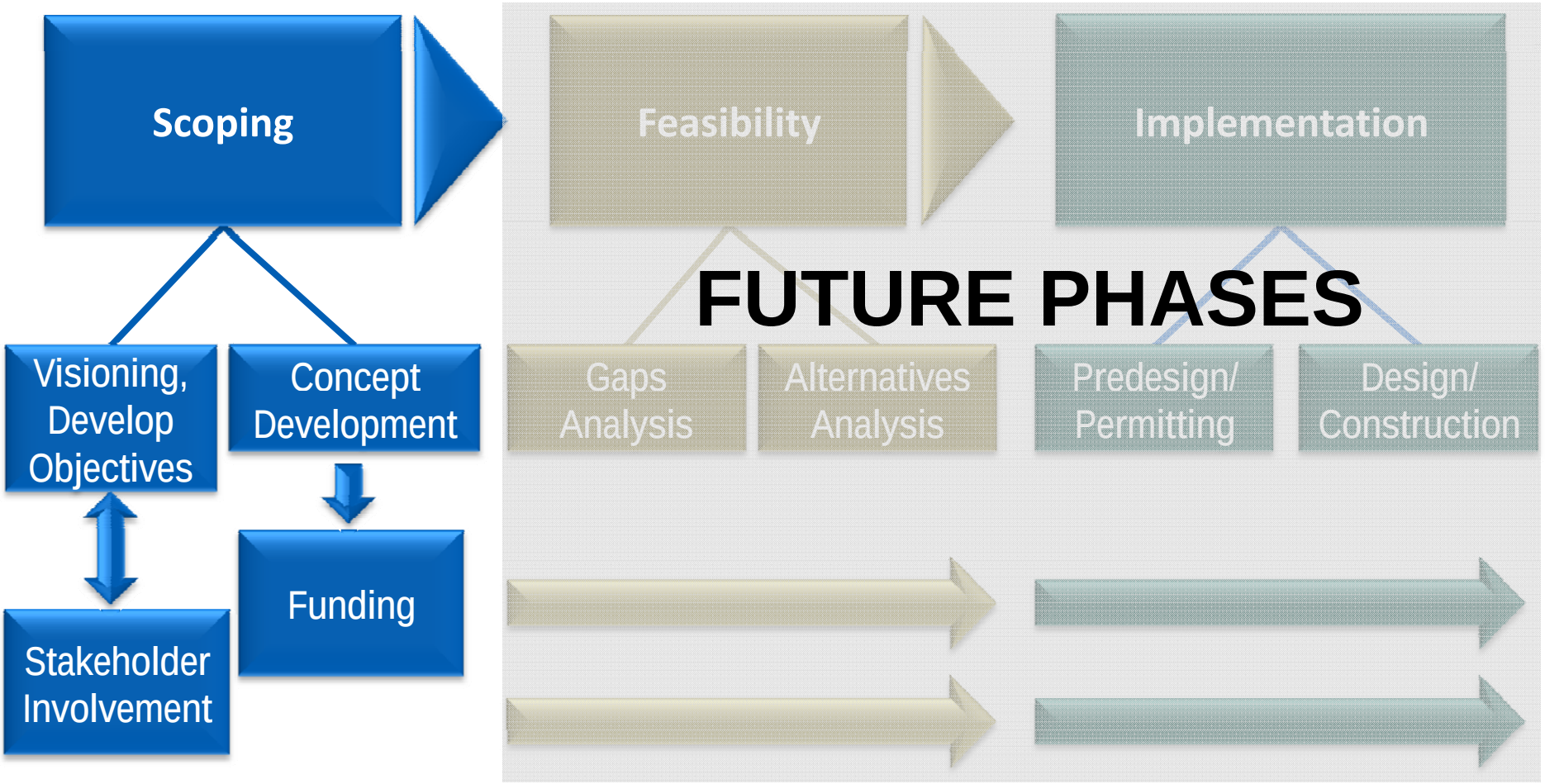
- Review flood and groundwater project concepts
- Describe screening and prioritization process and results
- Solicit input on concepts, and screening and prioritization evaluation

Project Basis

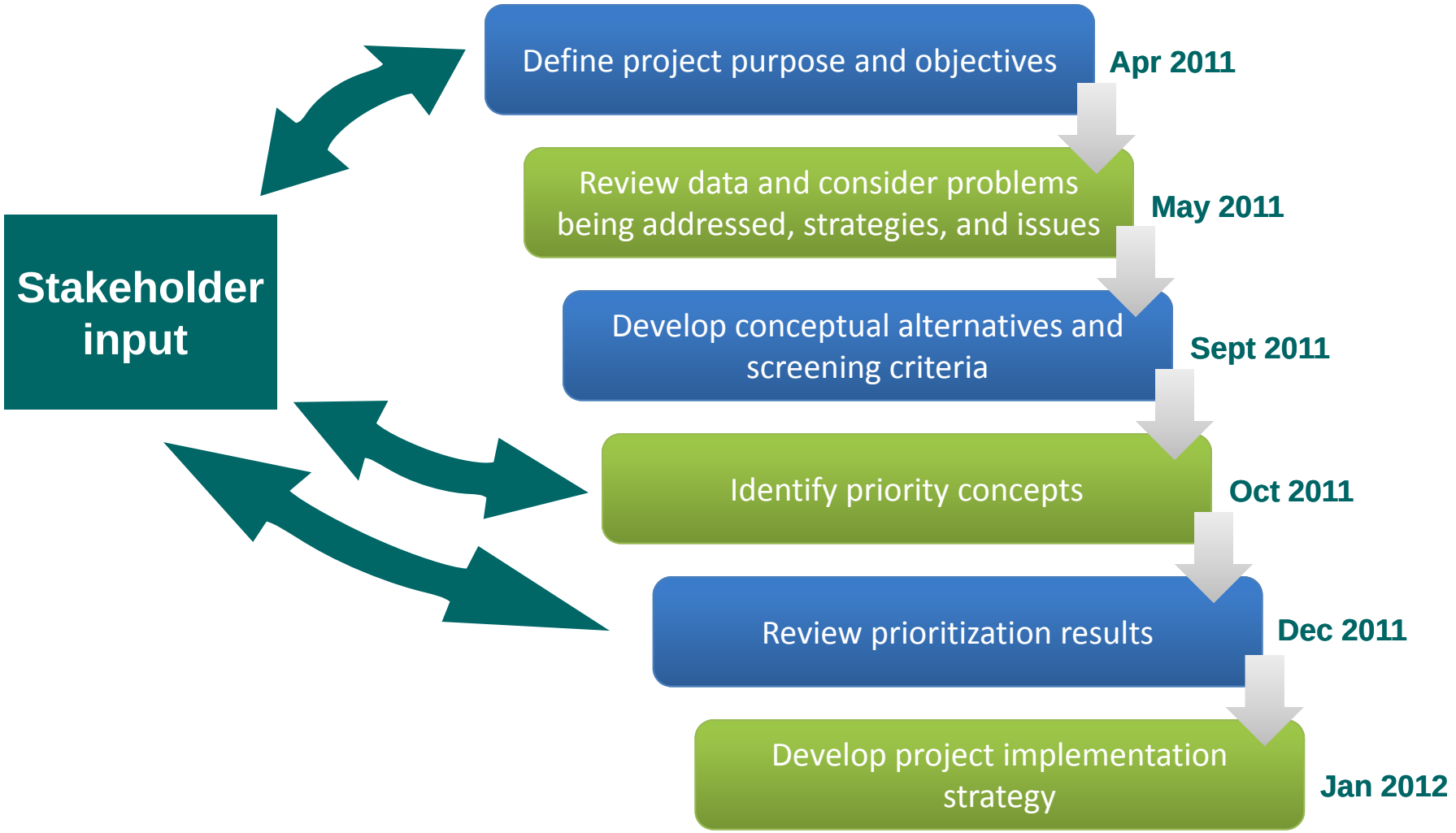
- Two core objectives
  - Provide up to 100-year flood protection
  - Increase groundwater recharge potential
- Seven supporting objectives
  - Water quality
  - Water supply
  - System Sustainability
  - Ecosystem
  - Agricultural land
  - Undeveloped land
  - Community benefits
- Projects are multi-benefit
  - Improve likelihood of outside funding
  - Provide additional implementation value
- Projects reflect input of partners, stakeholder groups, regulators and study area residents
  - Multiple workshops
  - Project tour
- Consistent with Water Agency mission and initiatives

Project Overview

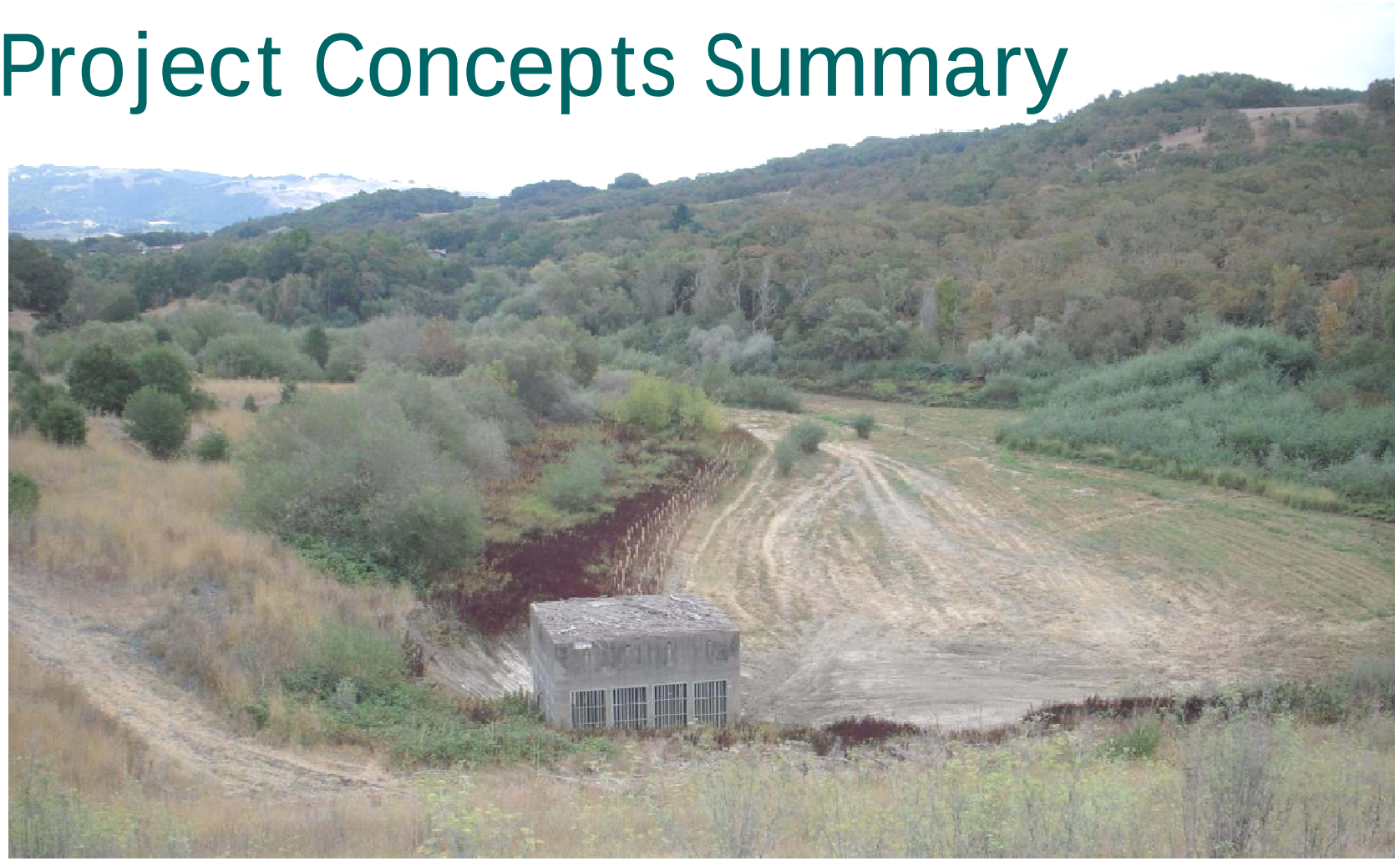
Planned Process – Phases of Work



Scoping Study Schedule

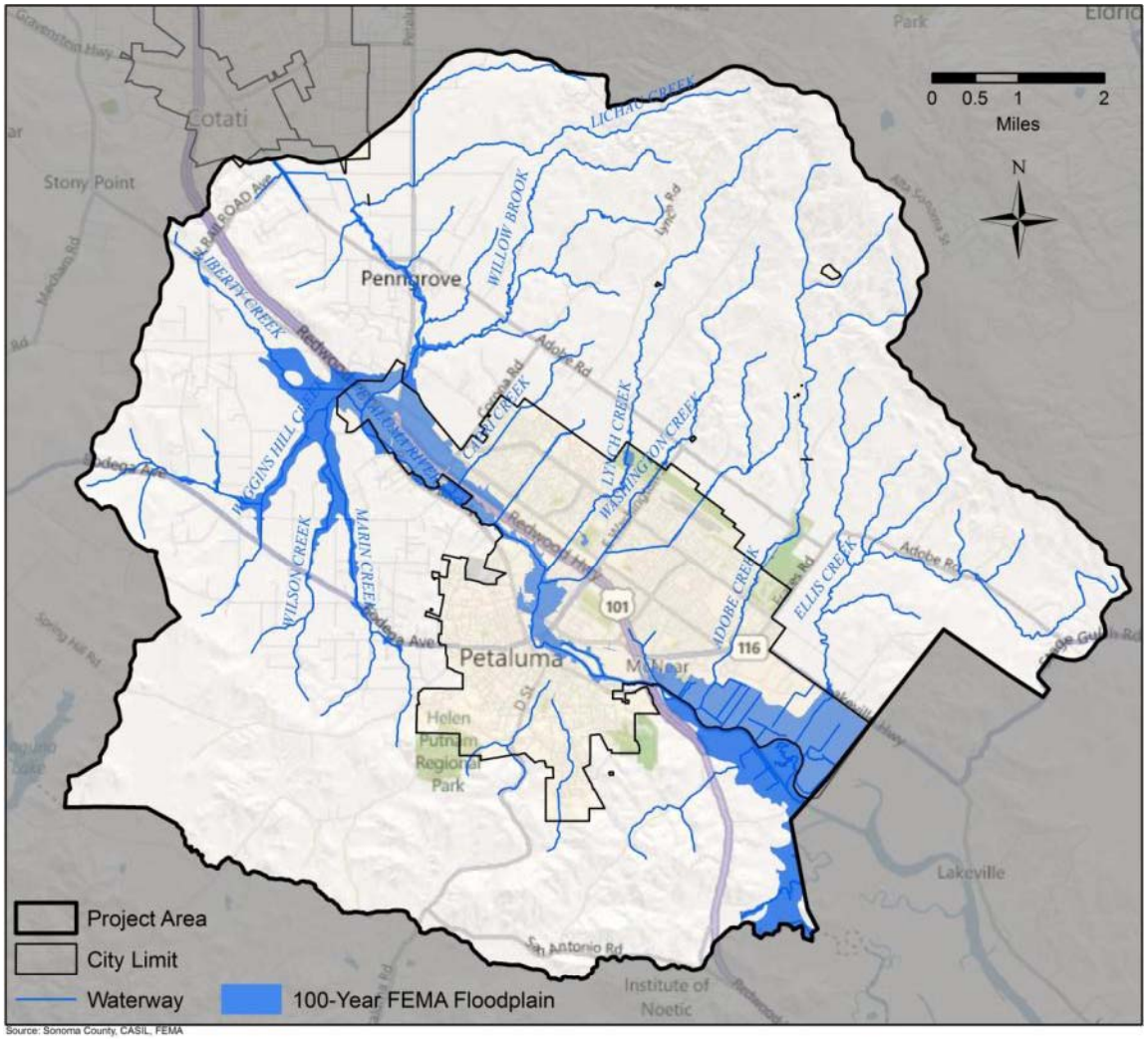


Project Concepts Summary



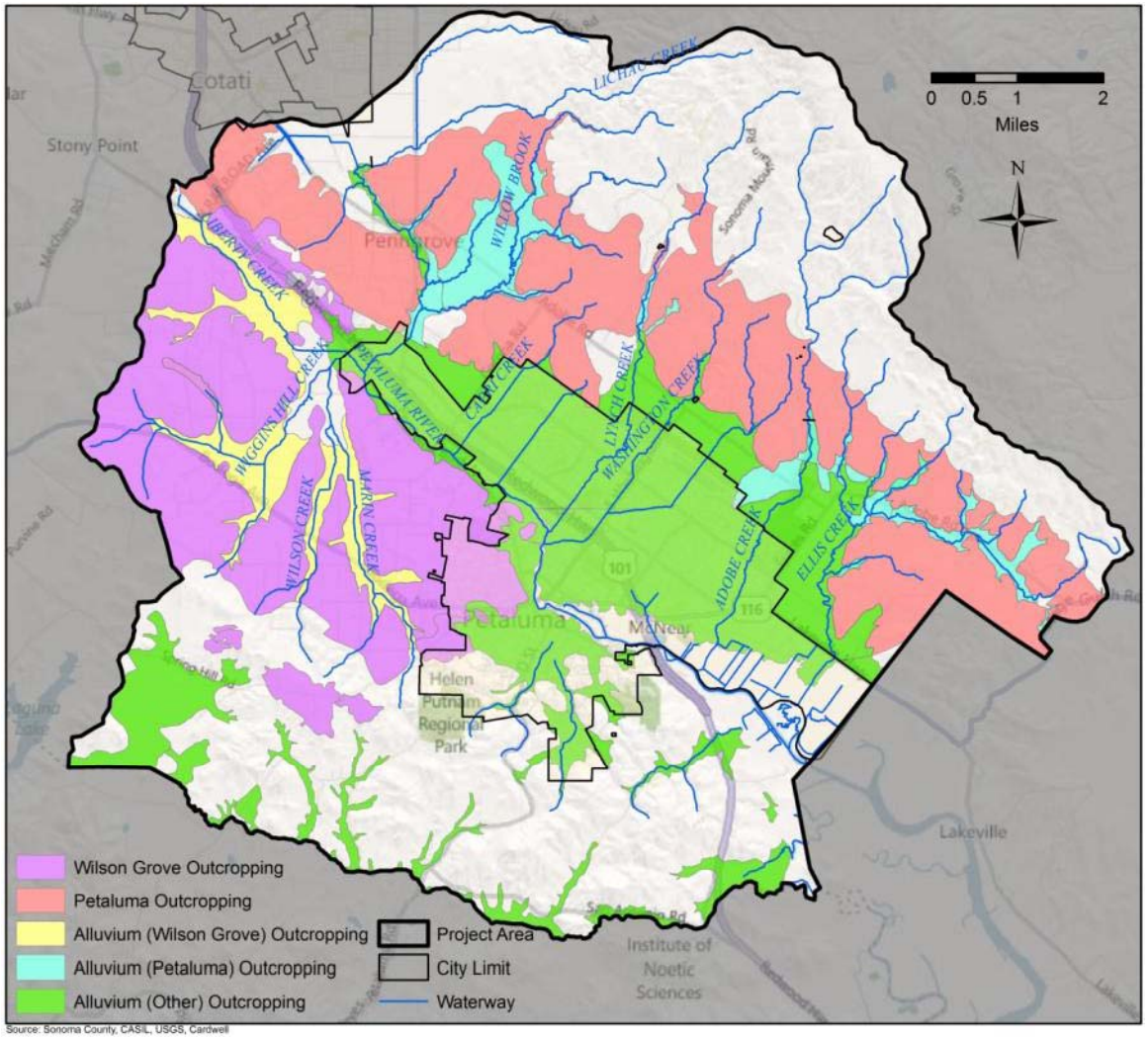
Flood Hazard Reduction Criteria

- Need to:
  - Reduce peak flows OR
  - Increase hydraulic capacity
- Impacts to downstream projects to be evaluated in feasibility phase
- Waterways upstream of and including Lynch Creek confluence
- Areas within 100-year floodplain are principal recipients of benefits



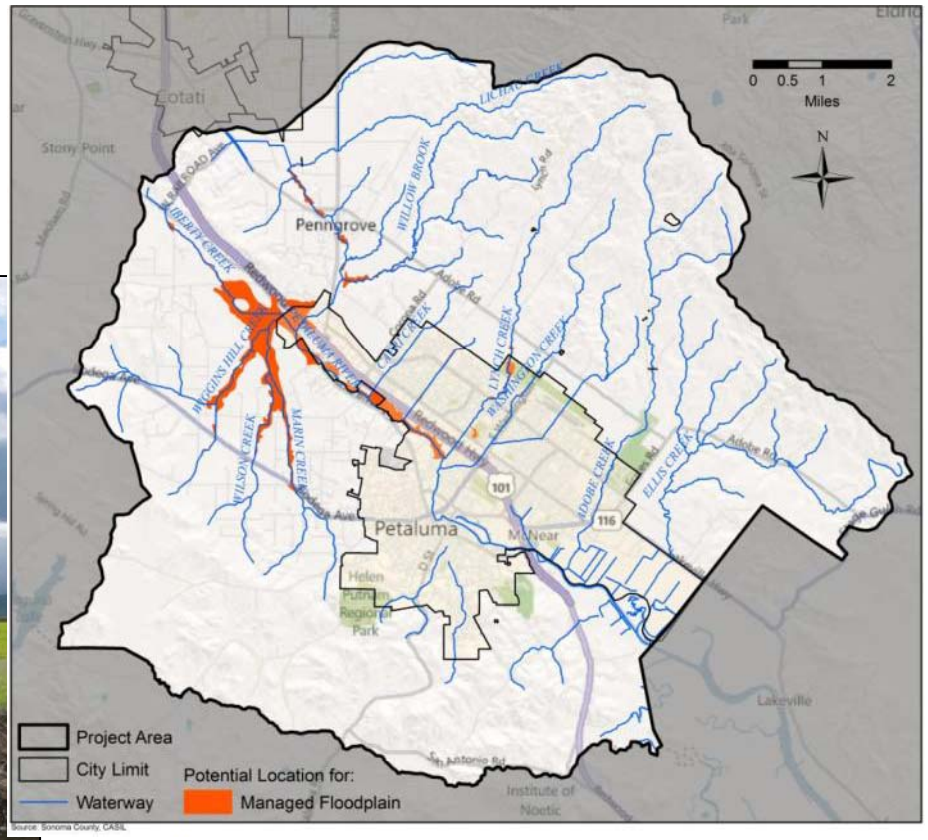
Recharge Criteria

- Wilson Grove Formation and Petaluma Formation are most effective for water supply recharge
- Alluvium above Wilson Grove and Petaluma also considered viable for water supply recharge
- Other alluvium could provide benefits other than water supply recharge



Concept 1: Managed Floodplain

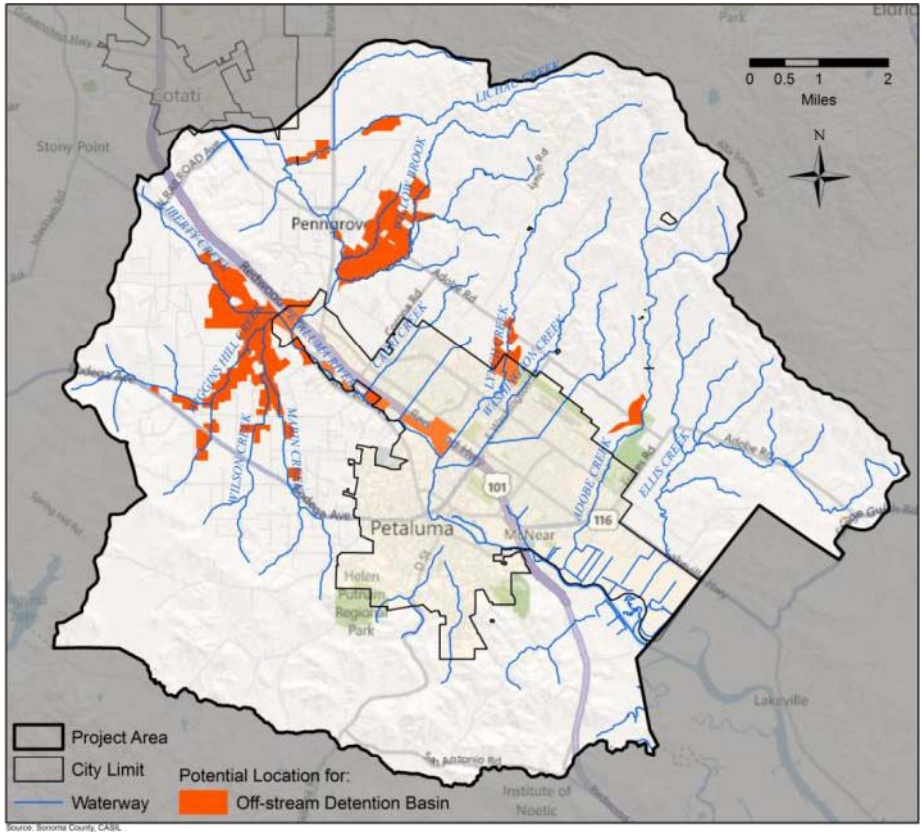
Goal: Maintain flood protection and recharge benefits provided by existing floodplain



Continued effectiveness of downstream flood projects depends on maintaining upstream storage benefits

Concept 2: Off-stream Detention

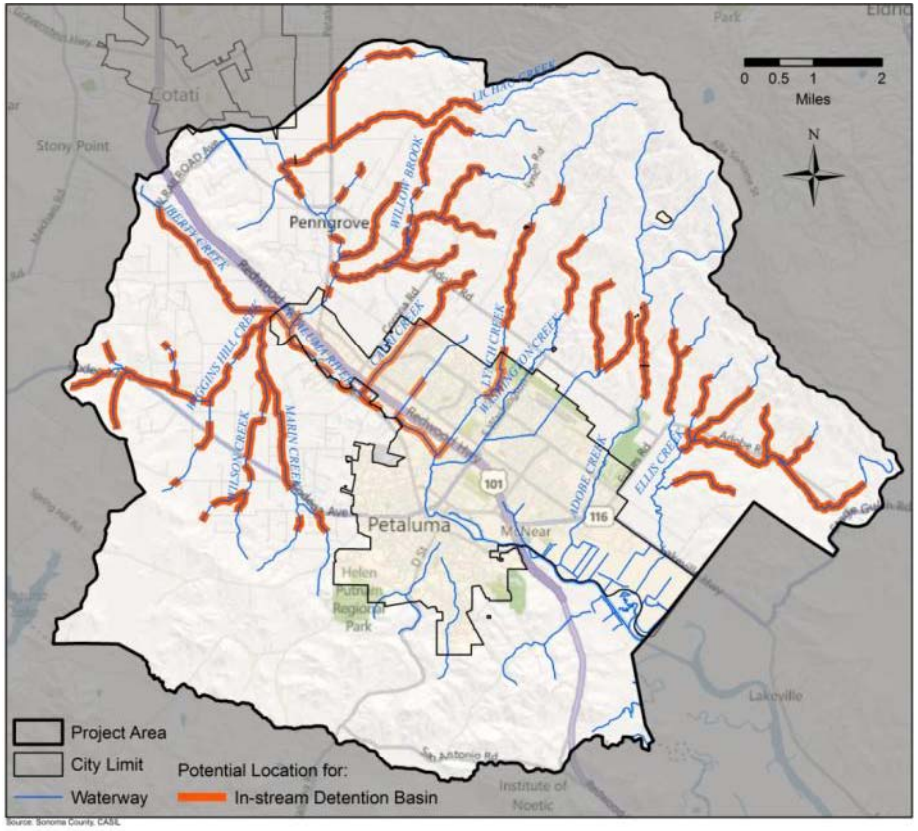
Goal: Divert high flows to temporary holding ponds for flood reduction and recharge



Concept keeps low flows in the channel to maintain environmental sediment-carrying conditions

Concept 3: In-stream Detention

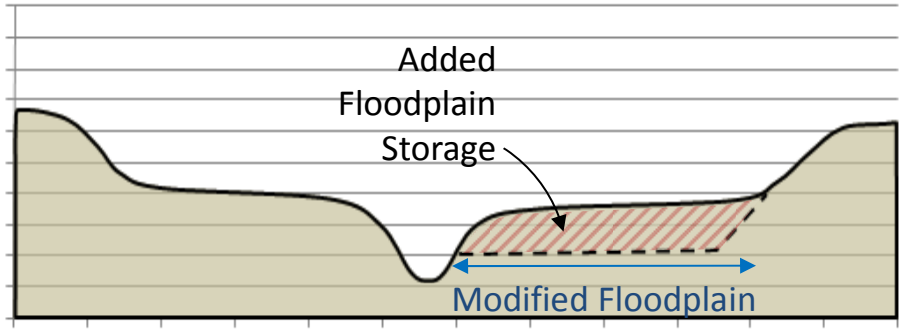
Goal: Detain high flows for flood reduction and recharge using the existing stream as a basis

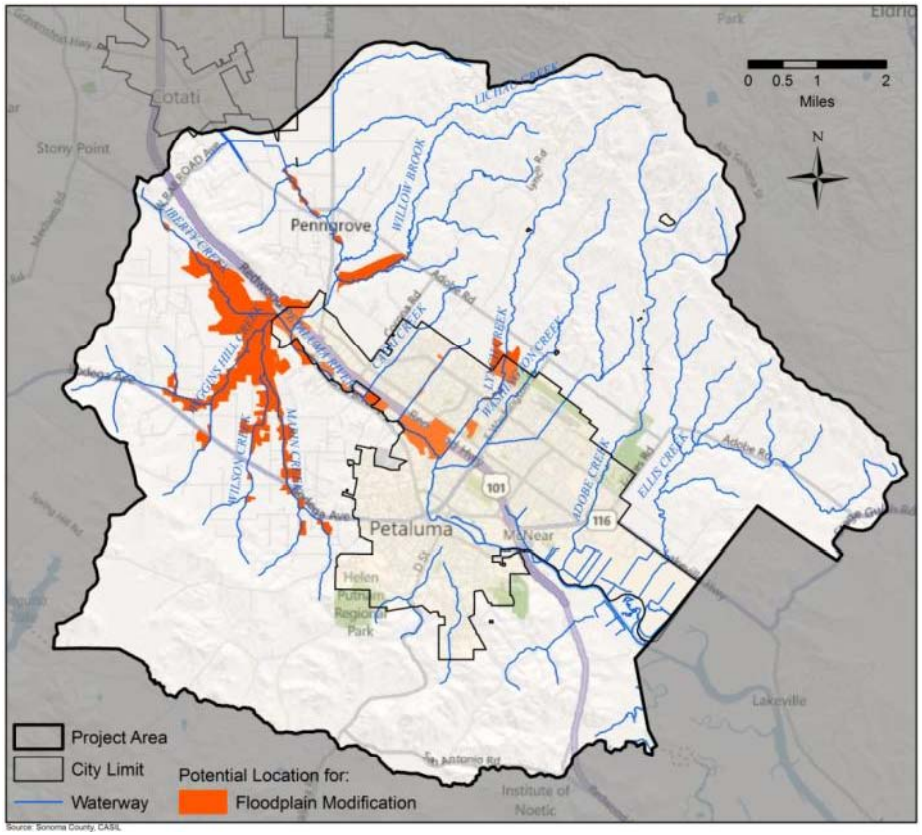


Concept can integrate local topography to reduce costs

Concept 4: Floodplain Modification

Goal: Create additional storage volume and potential recharge area using existing floodplains as a basis

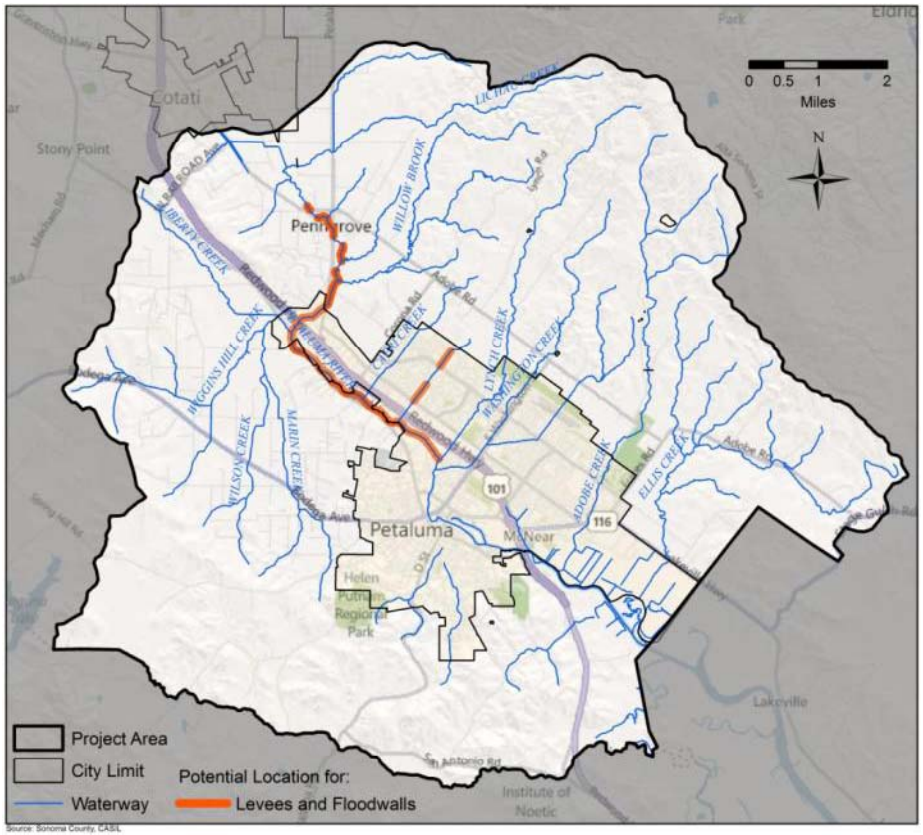




Same concept as Petaluma's Denman Terracing Project

Concept 5: Levee/Floodwall

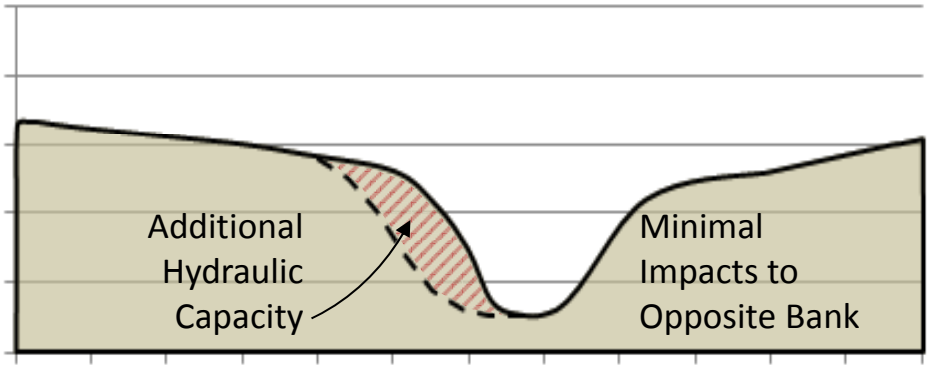
Goal: Constrain flows to a narrower pathway than the existing floodplain

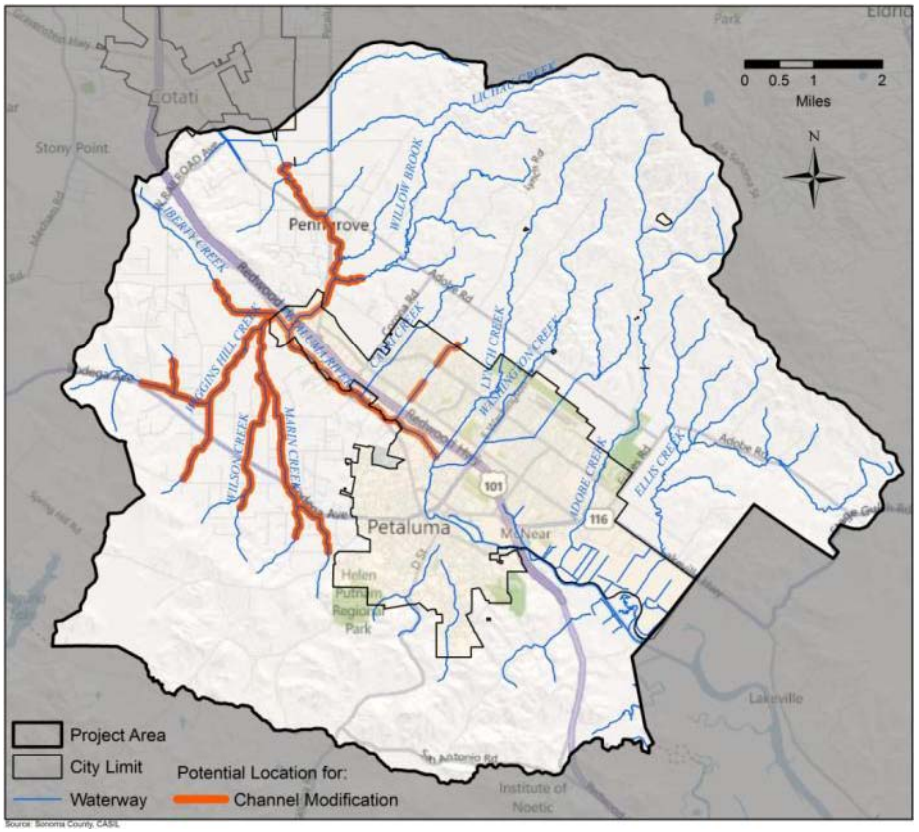


Project impact area directly correlated with benefit area

Concept 6: Channel Modification

Goal: Reshape channel section for increased capacity and recharge area





Project impact area directly correlated with benefit area

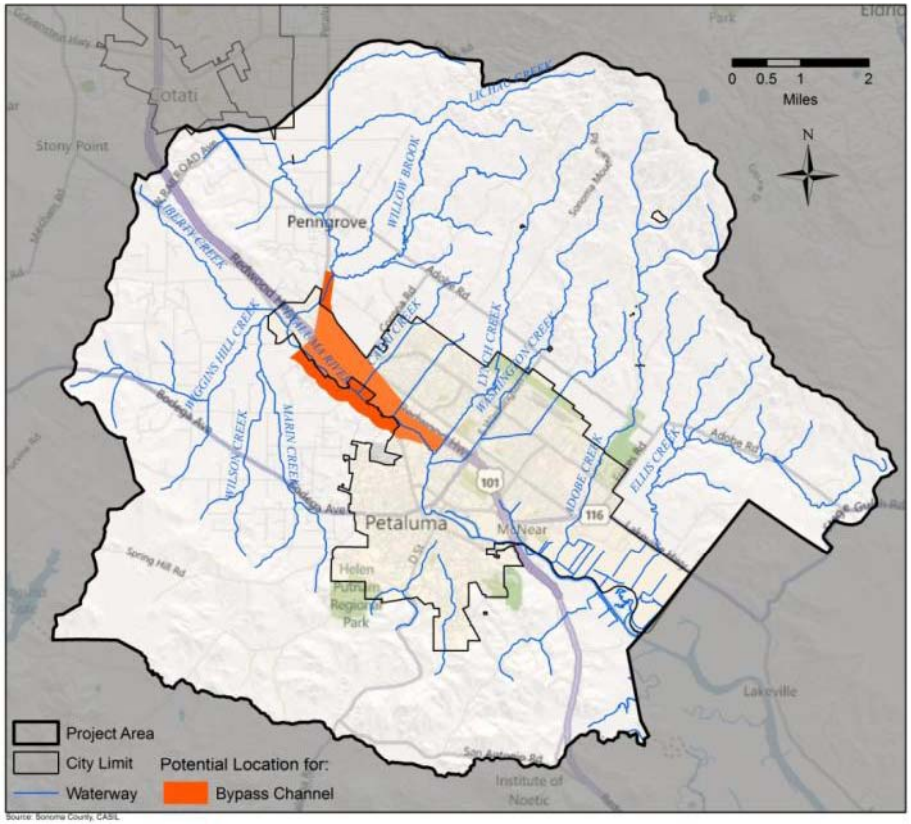
Concept 7: Bypass Channel

Goal: Divert high flows to parallel channel for flood reduction and potential recharge

Existing capacity leads to flooding

At-grade bypass can reduce flooding

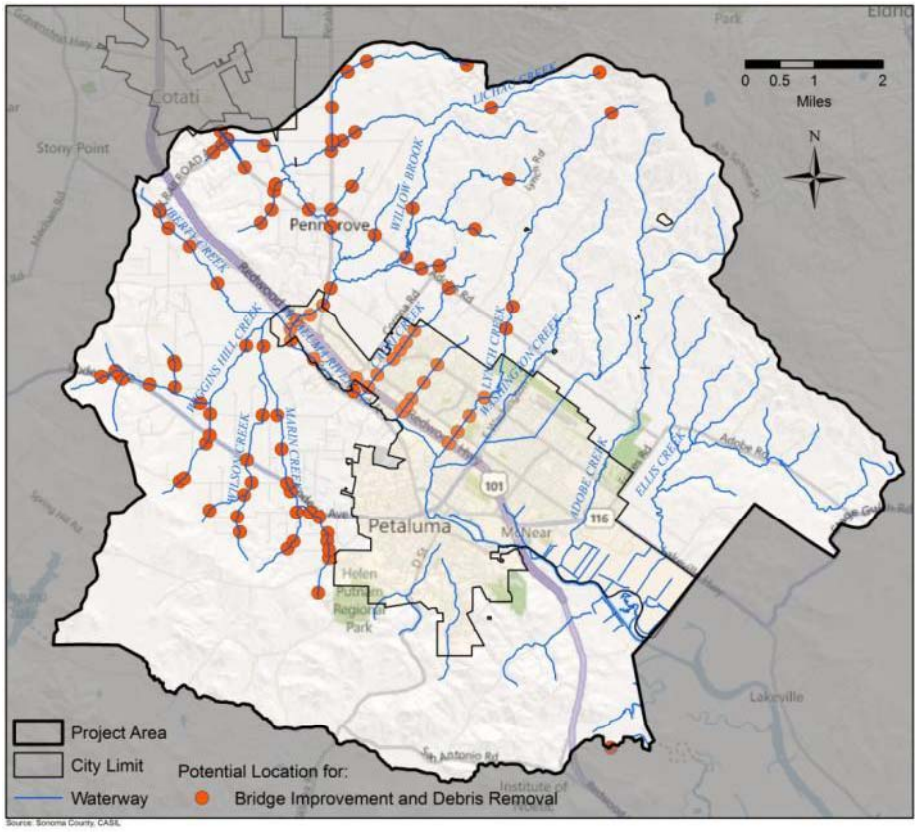
Buried bypass can reduce flooding



Concept keeps low flows in the channel to maintain environmental conditions and sediment transport characteristics

Concept 8: Bridge Improvement and Debris Removal

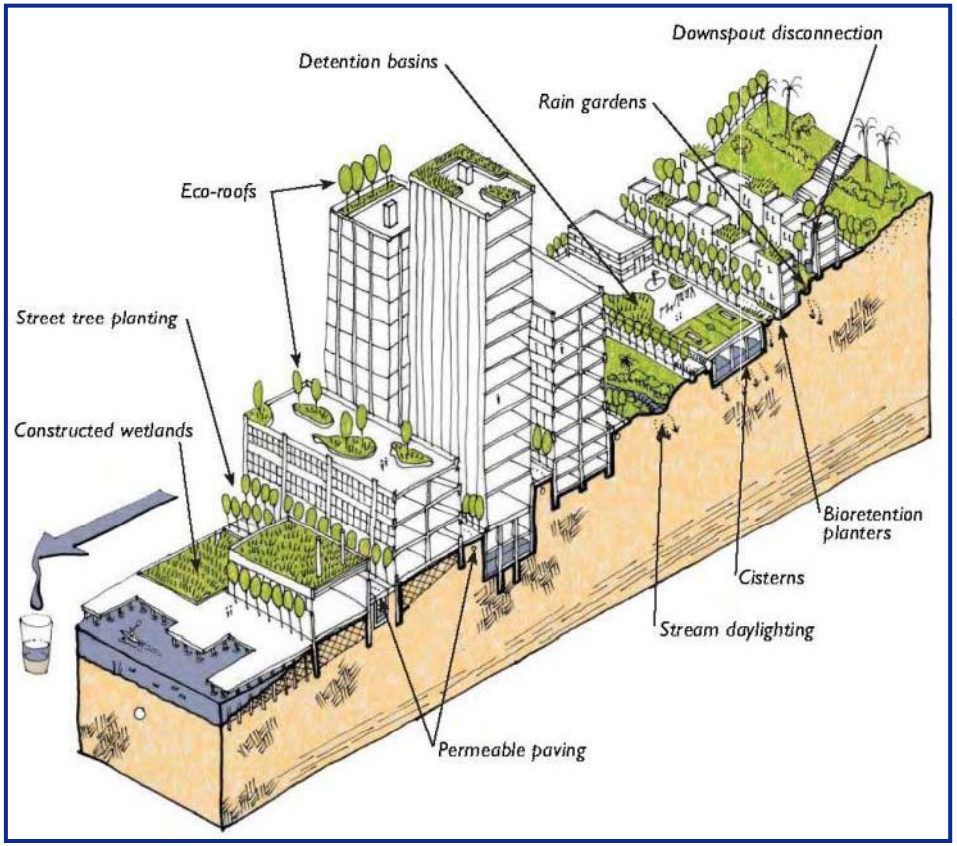
Goal: Improvement of bridge areas to reduce potential for flooding due to debris build-up



Concept could lead to less emergency operations and maintenance

Concept 9: Low Impact Development

Goal: Reduce development-related runoff and provide opportunity for recharge



Many LID practices improve runoff water quality

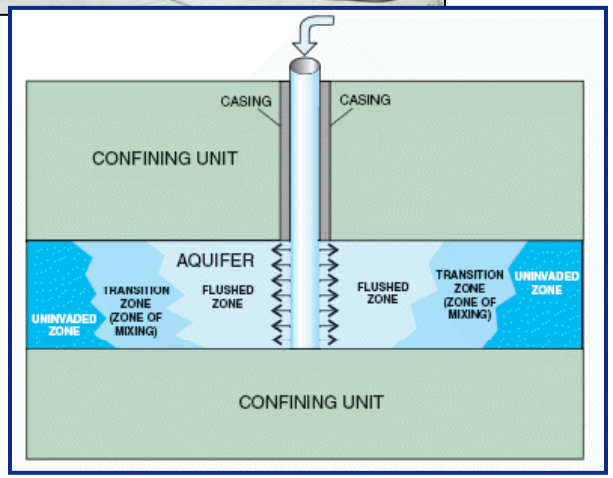
Concept 10: Policy Review and Development

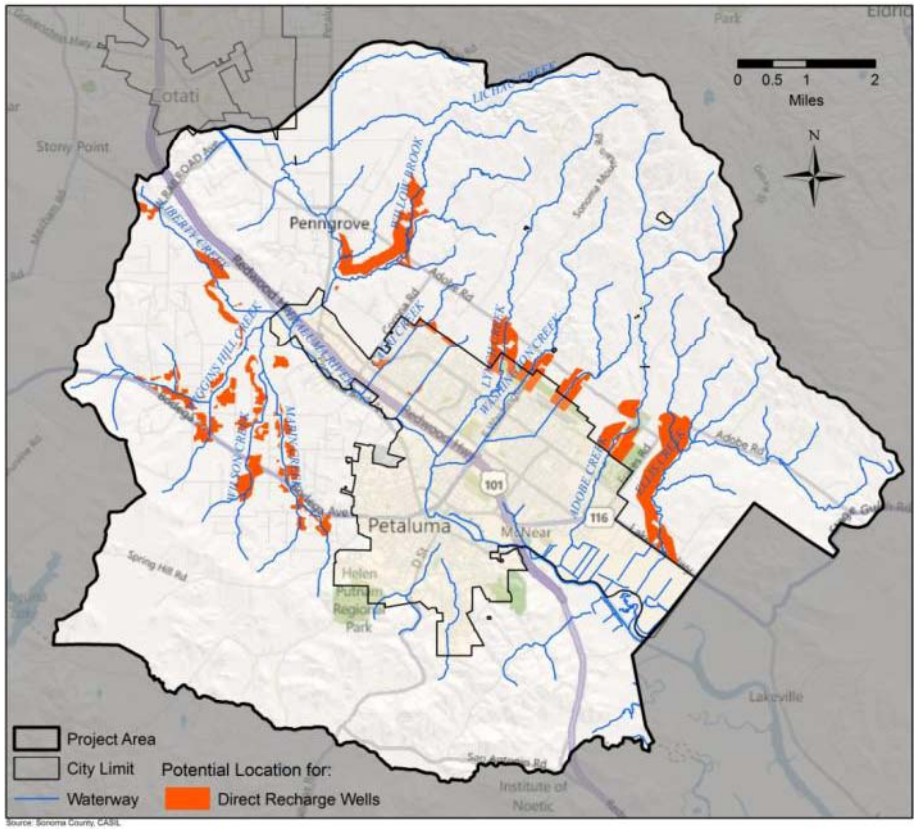
Goal: Identify policies that impact flood hazards and groundwater recharge and update as necessary

Collaborative concept could be applied at local or county-wide scales.

Concept 11: Direct Recharge

Goal: Recharge water directly into aquifers



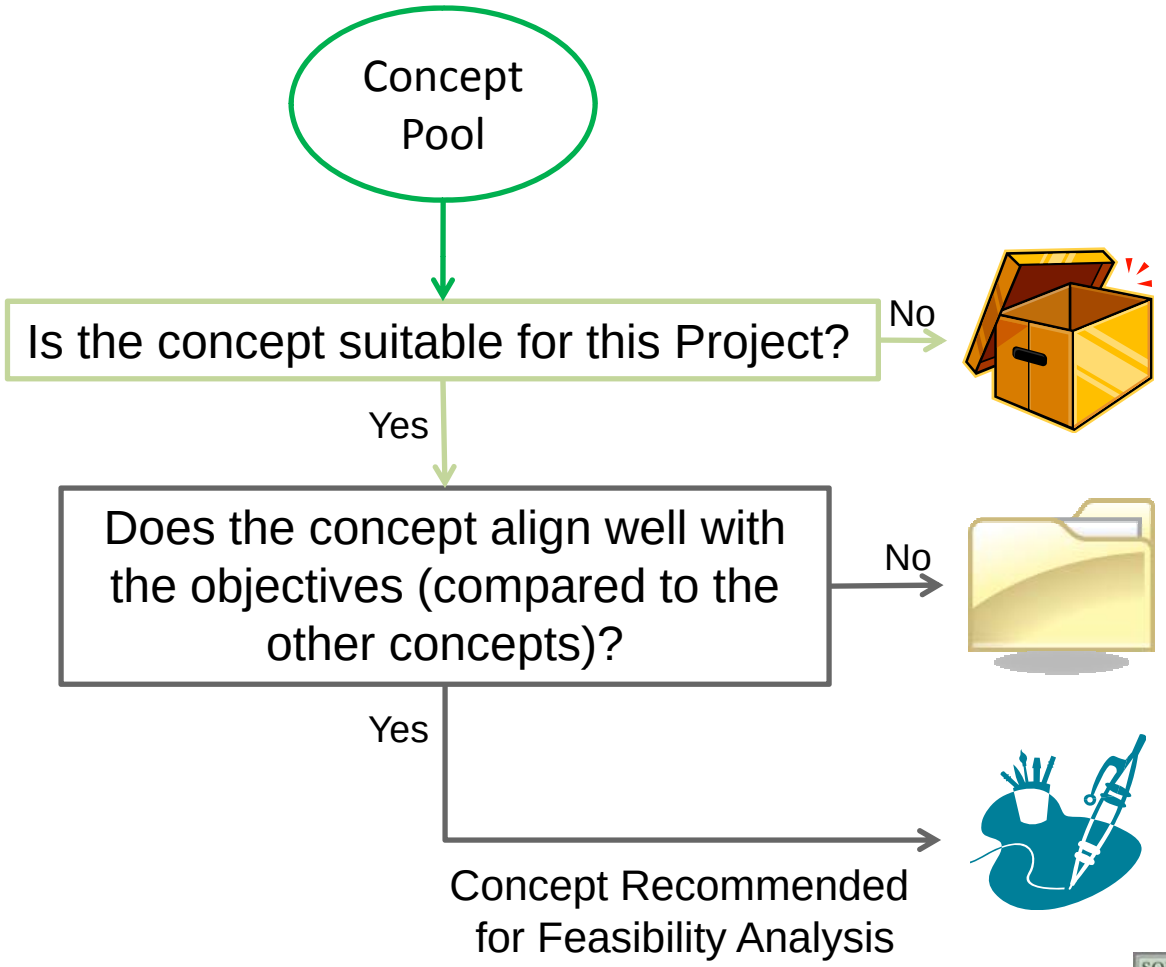


Better control of water quality entering aquifers than percolation methods

Concept Prioritization

Prioritization Process

- 2 Stages
  - Screening
  - Prioritization



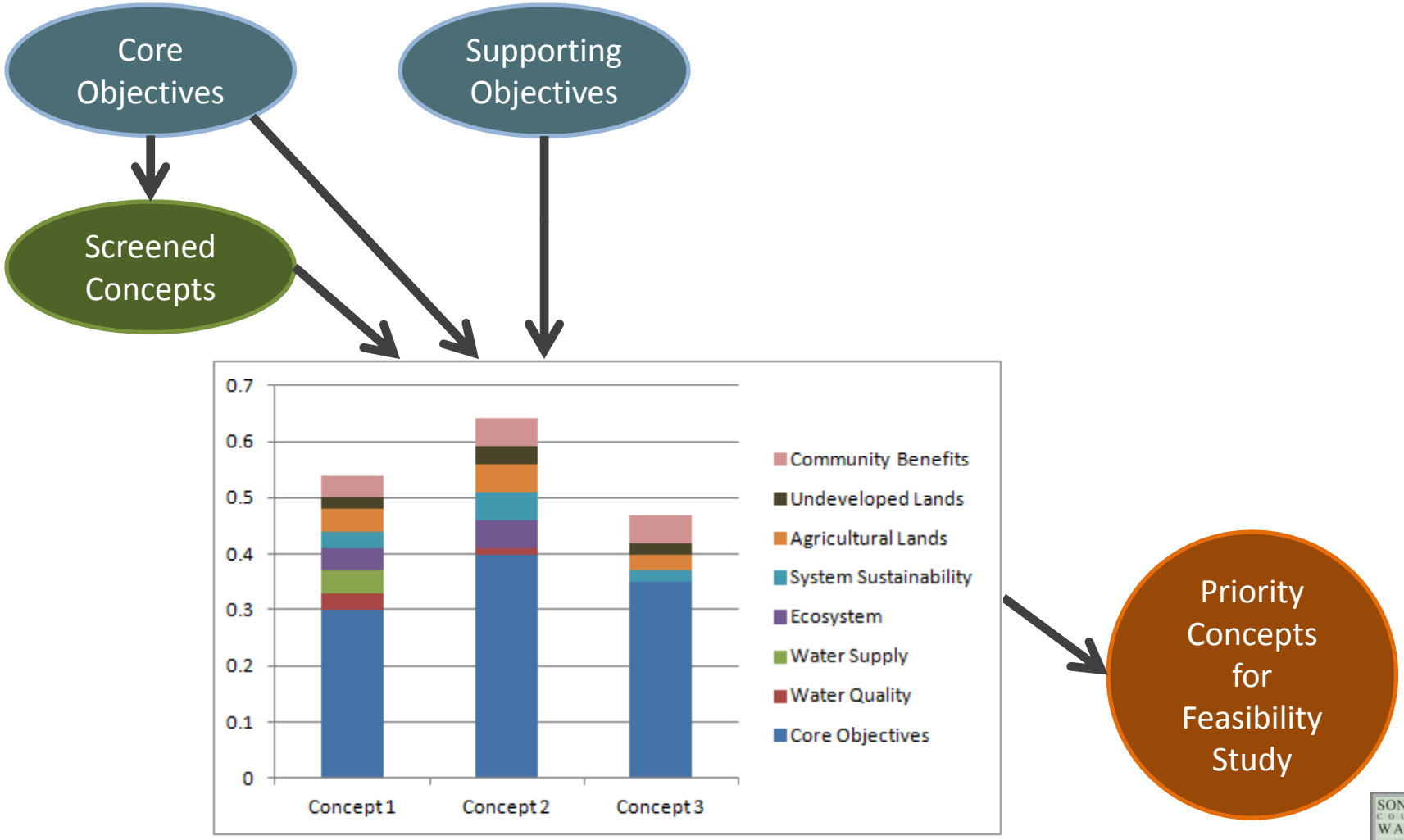
Screening Process

Does the Concept Provide Flood Hazard Reduction and Groundwater Recharge (Key Project Purpose)?

- Yes = Advanced to the prioritization process
- No = Not advanced to the prioritization process
  - Water Agency could consider participation through other venues

Concept	Response
1. Managed Floodplain	Yes
2. Off-stream Detention	Yes
3. In-stream Detention	Yes
4. Floodplain Modification	Yes
~~**5. Levee/Floodwall**~~	~~**No**~~
6. Channel Modification	Yes
7. Bypass Channel	Yes
~~**8. Bridge Improvement & Debris Removal**~~	~~**No**~~
9. Low Impact Development	Yes
10. Policy Review and Development	Yes
~~**11. Direct Recharge**~~	~~**No**~~

Objectives Support Concept Prioritization



Step 1: Objective Weighting Based on Public Input

Public indicated preferences by marking in the boxes provided on Concept & Prioritization Worksheet

Upper Petaluma River Watershed Flood Control Project – Scoping Study — Concept Prioritization Worksheet

Contact Information: _____ Name _____ Phone Number _____ Email Address

Please indicate the relative importance of the following 14 project concept evaluation criteria by placing one check mark per line.

Concept Evaluation Criteria	High	Medium	Low
1. Reduce flood hazards	√		
2. Increase groundwater recharge	√		
3. Protect or improve surface water quality		√	
4. Protect or improve groundwater quality		√	
5. Protect or improve water supply reliability	√		
6. Reduce channel erosion and sediment deposition			√
7. Protect or improve aquatic and upland habitat conditions		√	
8. Preserve or enhance stream buffers and riparian areas			√
9. Preserve or enhance existing agricultural land uses	√		
10. Preserve or enhance existing undeveloped lands		√	
11. Preserve or enhance designated open space		√	
12. Provide public access to project site			√
13. Include educational features as part of project			√
14. Include recreational features as part of project			√

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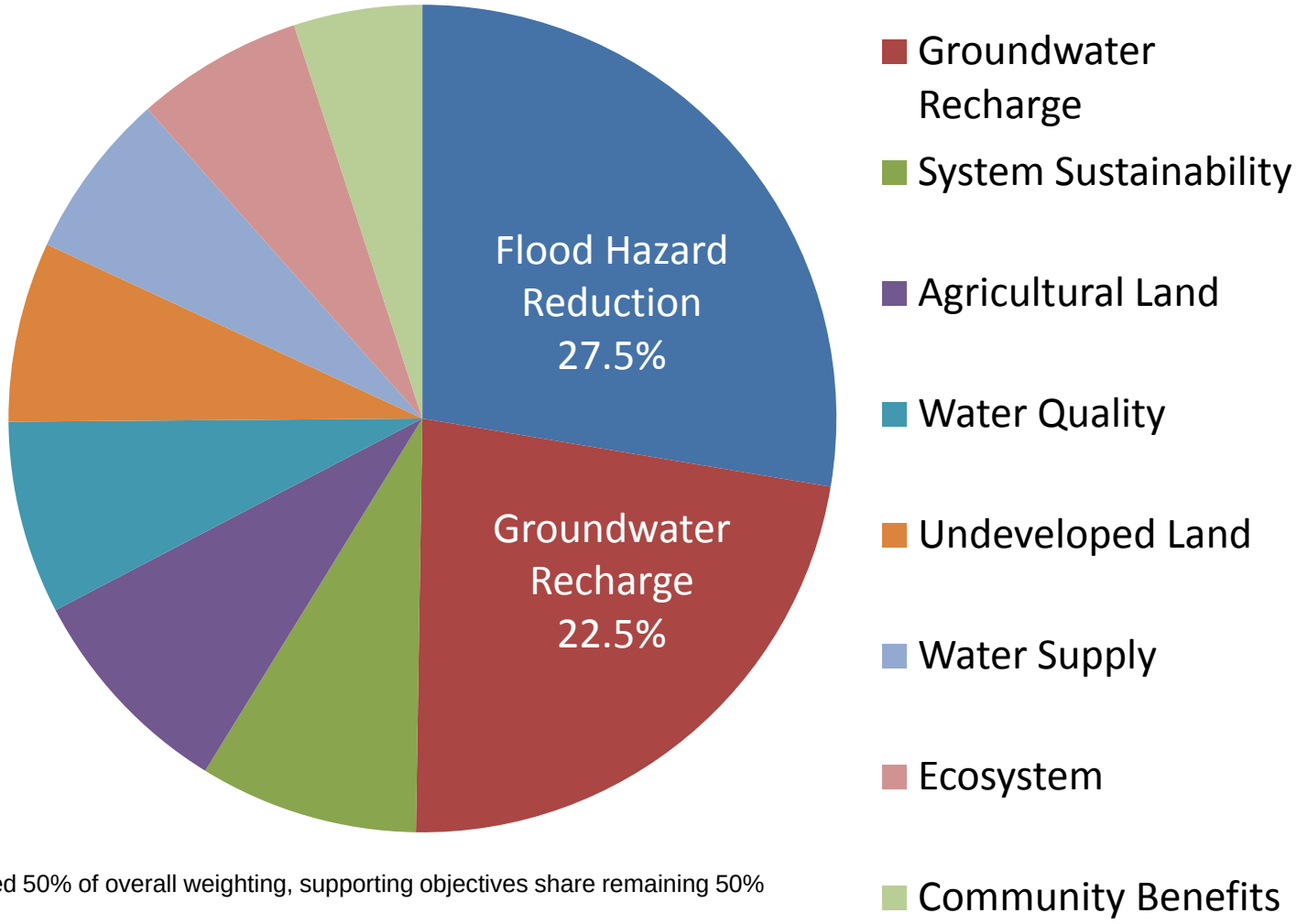
High = Score of 3

Medium = Score of 2

Low = Score of 1
Blank = Score of 0

Results of Objective Weighting, Oct 5th



Core objectives received 50% of overall weighting, supporting objectives share remaining 50%

Step 2: Evaluate Each Concept and How it Satisfies Objectives

Objective	Managed Floodplain	Off-stream Detention Basin	In-stream Detention Basin	Floodplain Modification	Channel Modification	Bypass Channel	Low Impact Development	Policy Review and Development
Flood Hazard Reduction	1	3	3	3	3	3	1	1
Groundwater Recharge	1	1	1	1	1	1	1	1
Water Quality	1	2	2	2	1	1	2	1
Water Supply	1	1	1	1	1	1	2	1
System Sustainability	3	3	1	3	2	2	3	1
Ecosystem	3	3	0	2	1	3	1	1
Agricultural Land	3	1	1	2	2	1	3	1
Undeveloped Land	3	2	2	2	2	1	3	1
Community Benefits	1	1	1	1	1	1	1	1

3 = Provides a high level of benefit

2 = Partially meets objective

1 = Uncertain ability to fulfill intent of objective

0 = Does not fulfill objective

Baseline Prioritization Results

Rank	Concept	Score
1	Floodplain Modification	0.67
1	Off-stream Detention Basin	0.67
3	Channel Modification	0.6
4	Bypass Channel	0.59
5	In-stream Detention Basin	0.54
5	Managed Floodplain	0.54
5	Low Impact Development	0.54
8	Policy Review and Development	0.33

High scores better fit objectives of the Project

Sensitivity analysis supports baseline results

Additional Considerations

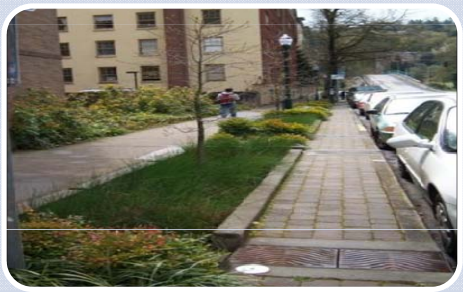
- Cost
  - Not considered a fatal flaw
  - Buried off-stream detention costs are high and may not be justified
  - Buried bypass channel costs high and may not be justified
- Implementation Feasibility
  - In-stream detention basins: high mitigation and maintenance, difficult to permit
  - Channel modification: permitting and maintenance less difficult than in-stream detention basins, but relatively challenging

Recommended Prioritization

Tier 1	Floodplain modification	Off-stream detention basin		Recommended basis for feasibility phase
Tier 2	Channel modification	Surface bypass channel		Support project concepts in Tier 1
Tier 3	Buried off-stream detention basin	In-stream detention basin	Buried bypass channel	Not recommended for implementation at this time

Enhancement Concepts

Managed Floodplain

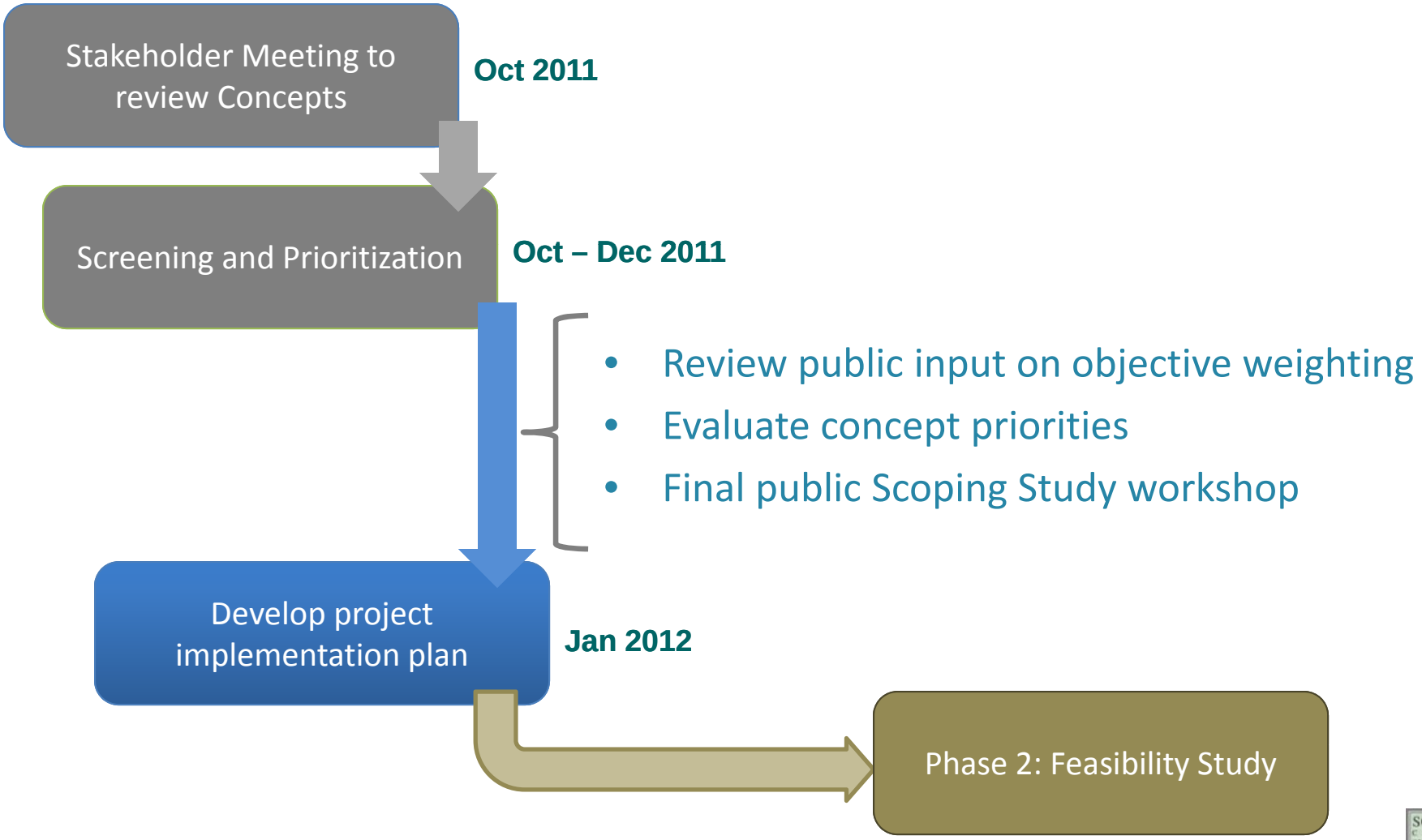


Low Impact Development

Policy Review and Development

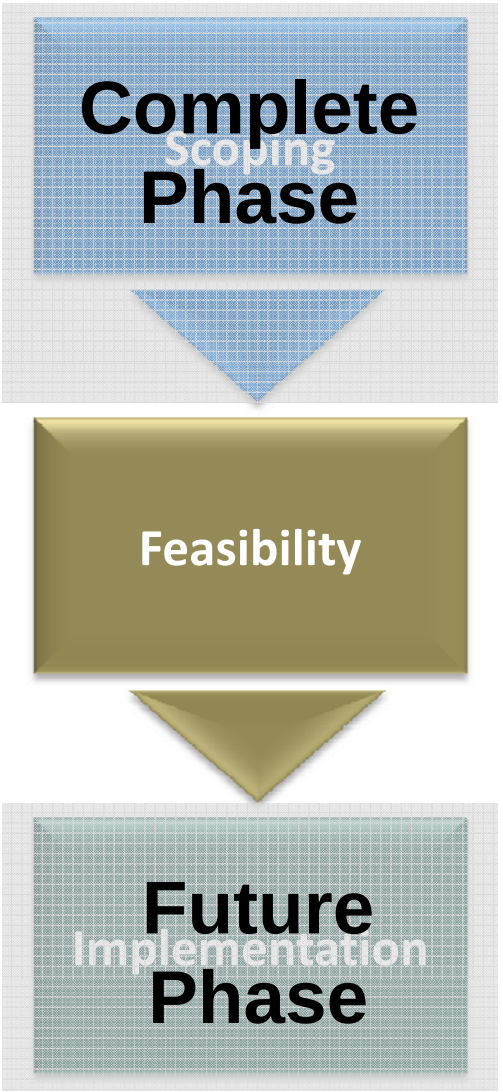
- Potential implementation in parallel with one or more tiered concepts to:
  - Increase security of existing benefits
  - Improve overall benefits
  - Increase funding chances

Next Steps


Stakeholder Meeting to review Concepts
Oct 2011
Screening and Prioritization
Oct – Dec 2011
Review public input on objective weighting
Evaluate concept priorities
Final public Scoping Study workshop
Develop project implementation plan
Jan 2012
Phase 2: Feasibility Study

Next Phase: Feasibility Study

- **Identify alternative sites**
- Define alternatives
- **Model hydraulic system to verify benefits and avoided impacts**
- Perform field testing (e.g. sediment, groundwater quality, geologic)
- Model sediment transport, water quality, and recharge
- Develop alternative details
- **Benefit and cost analyses**
- **Preferred alternative selection**



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BACK-UP

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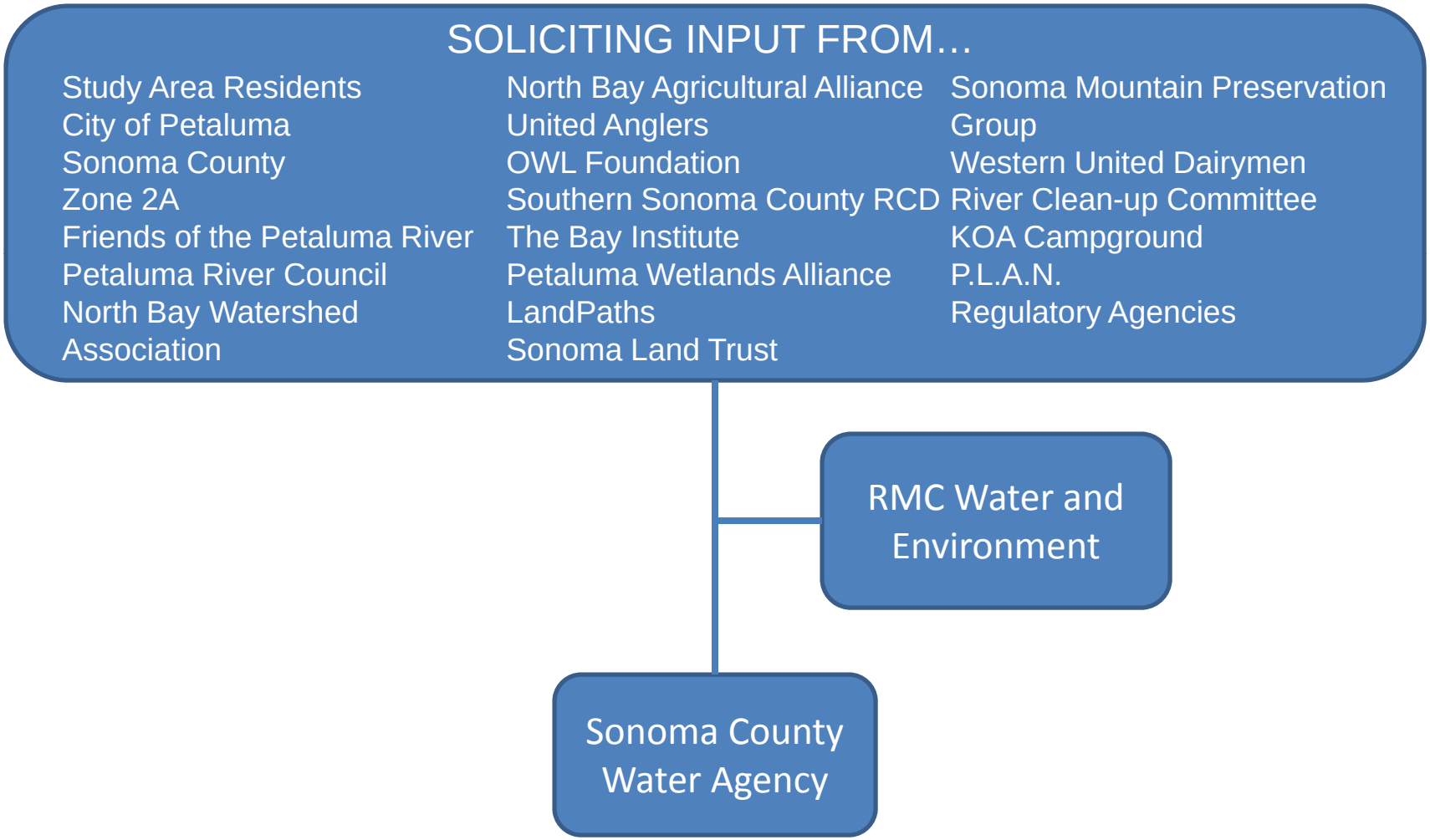
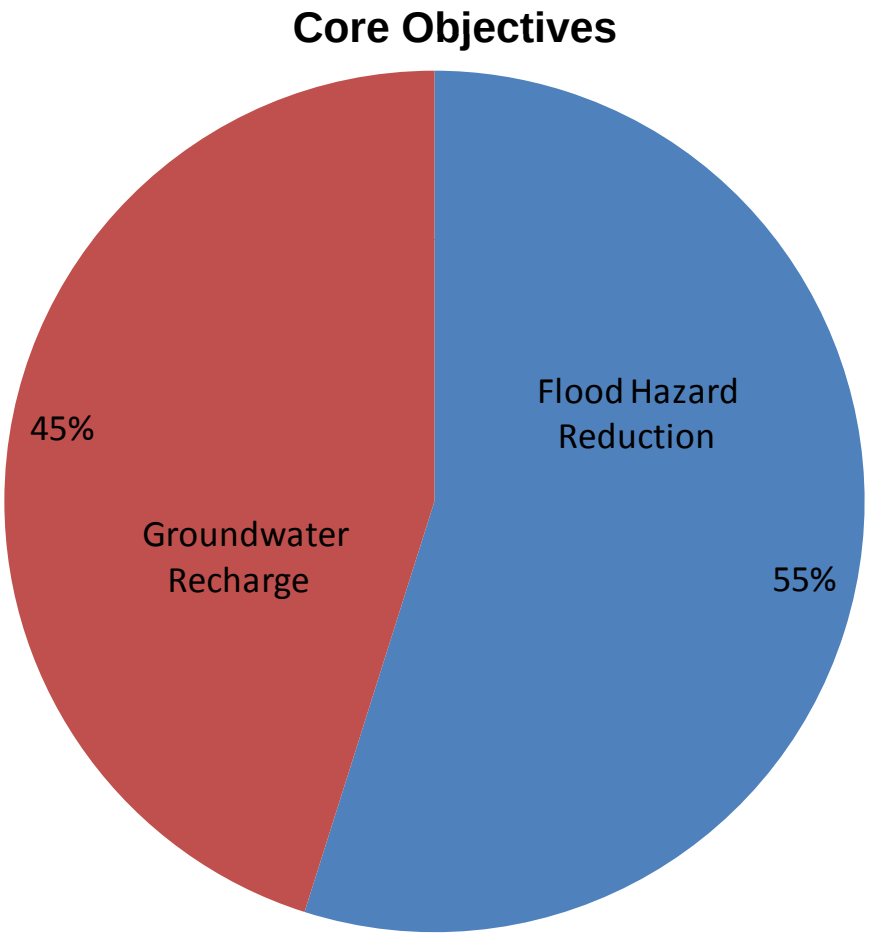
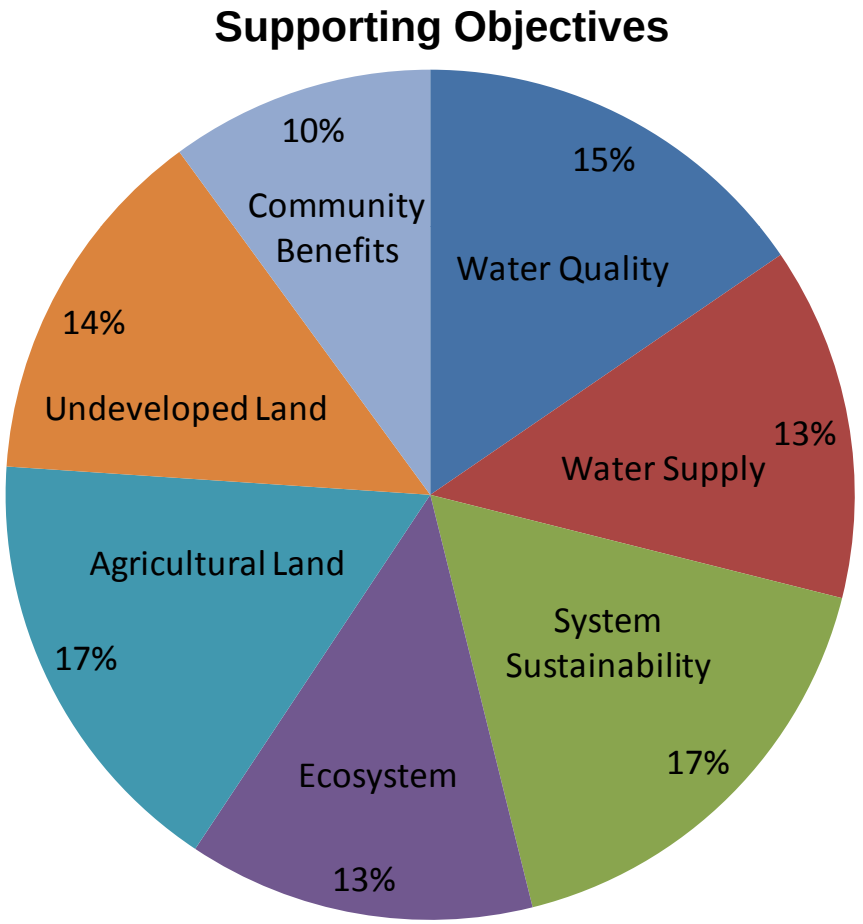
Project Participants



Public Input on Weighting





Note: Percentages may not sum to 100% due to rounding.