Salinas Valley Basin GSA

Projects and Management Actions

Presented to Eastside Aquifer
Subbasin Committee
April 7, 2021

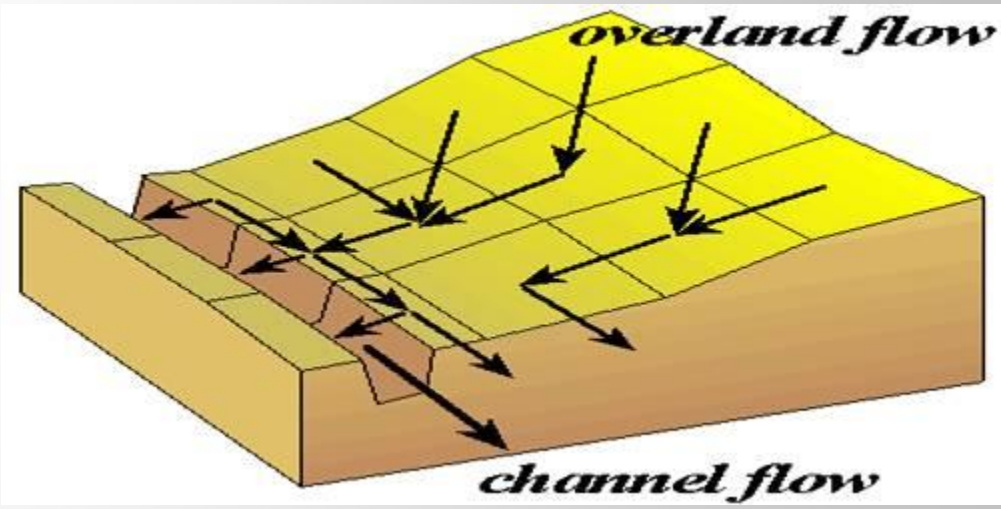
MONTGOMERY
& ASSOCIATES

Projects and Management Actions

- **Increased Recharge**
  1. Managed aquifer recharge of overland flow
  2. Floodplain restoration program, including Gabilan Floodplain Enhancement Project
- **Decreased Demand**
  3. Conservation and agricultural Best Management Practices (BMPs)
  4. Fallowing, Fallow Bank, and Agricultural Land Retirement
  5. Pumping Management
- **New Water Supplies for Recharge or Direct Use**
  6. Surface Water Diversion from Gabilan Creek
  7. 11043 Diversion at Chualar
  8. 11043 Diversion at Soledad
  9. Salinas Scalping Plant
  10. Eastside Irrigation Project (Somovia Road)
- **Valley-Wide Projects, Including Projects that Result in Reoperation of the Reservoirs**
  11. Winter Releases with Aquifer Storage and Recovery (ASR)
  12. Interlake Tunnel and Spillway Modification
  13. Drought Reoperation
  14. Multi-Benefit Stream Channel Improvements
  15. CSIP Expansion and Optimization
- **Implementation Actions**
  16. Support Protection of Areas of High Recharge
  17. GEMS Expansion
  18. Domestic Water Partnership
  19. Local Groundwater Elevation Trigger
  20. Well Registration

1. Managed Aquifer Recharge of Overland Flow

- **Description:** Program that incentivizes development of recharge basins that collect and recharge local overland flow from upland regions before it reaches streams
- **Project Benefit**: Enhance sustainable yield and groundwater elevations. Further analysis is needed for quantification of projected project benefits.
- **Cost**: Not estimated at this time



2. Floodplain Restoration Program including Gabilan Floodplain Enhancement Project

- **Description:** This project restores areas along creeks and floodplains with to slow and sink flood waters and encourage streambed and floodplain infiltration.
- **Project Benefit**: The primary benefit is increased groundwater elevations in the proximity of the utilized floodplains.
- **Unit Cost**: $230/AF*

*The potential recharge rate is unknown. There might be additional costs for feasibility studies or dry wells or injection wells.

Figure 4: 2011, 14 years self-sustained, excellent steelhead habitat

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/tx/home/?cid=stelprdb1247762

3. Conservation and Agricultural BMPs

- Leveraging evapotranspiration (ET) data
  - Incorporate ET data with soil moisture sensors, soil nutrient data, and flow meter data to help inform more efficient irrigation practices
  - Secure funding and/or coordinate with existing local agricultural extension specialists who conduct research and provide technical assistance to growers
- Education and outreach
  - Support existing local agricultural extension specialists with their education and outreach on BMPs to increase water conservation and decrease pumping
  - Use technical workshops and partnerships to accomplish outreach effectively and efficiently with growers

3. Fallowing, Fallow Bank, and Agricultural Land Retirement

Focused on retiring land to reduce groundwater extraction, including through:

- **Rotational Fallowing**: Every grower is required to fallow some percentage of land or a rotating basis.
- **Fallow Bank**: All growers could contribute to a bank. Anybody fallowing land could draw against the bank to offset the lost income from fallowing.
- **Ag Land Retirement**: development of a system for voluntary agricultural land retirement or to pay to retire agricultural land, effectively reducing the amount of groundwater used in the Subbasin.

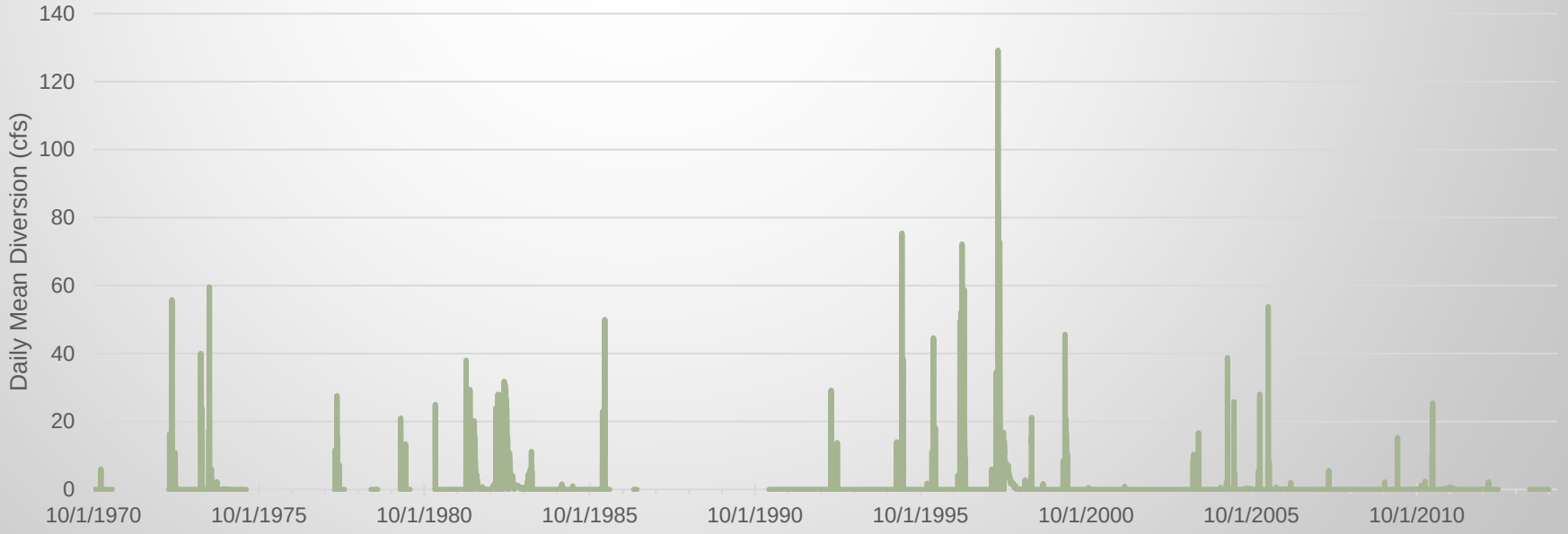
Costs: The cost for voluntary fallowing and land retirement would be relatively low cost in comparison to other projects; however, a more detailed analysis is needed.

5. Pumping Management

- **Description:** Pumping allocations and control based on various criteria (allocation structure not yet defined).
- **Project Benefit**: The primary benefits expected for this project is that it is another demand-side management tool and would enhance sustainable yield and groundwater elevations. Working within a groundwater budget allows the subbasin to meet its sustainable yield volume.
- **Cost**: The cost would be relatively low cost in comparison to other projects; however, a more detailed analysis is needed.

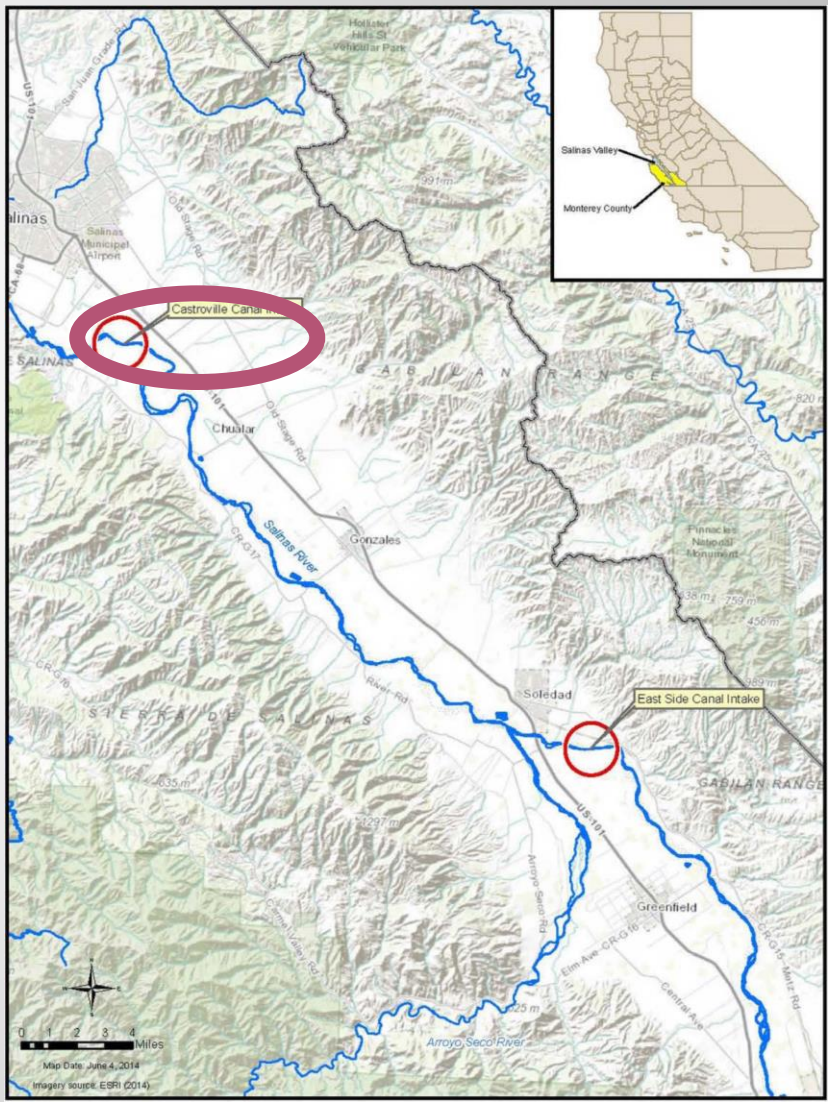
6. Surface Water Diversion from Gabilan Creek

- **Description:** This project entails diverting flood flows from Gabilan Creek and recharging this water at a nearby location in either recharge basins or dry wells.
- **Project Benefit**: Based on analysis of historical data, the expected benefit of this project would potentially capture 350 AF/yr. with a diversion structure with a capacity of 20 cfs.
- **Capital cost**: estimated at $5,477,000. Including annual operations and maintenance and annualized, the unit cost for water stored is $1,800/AF/yr.



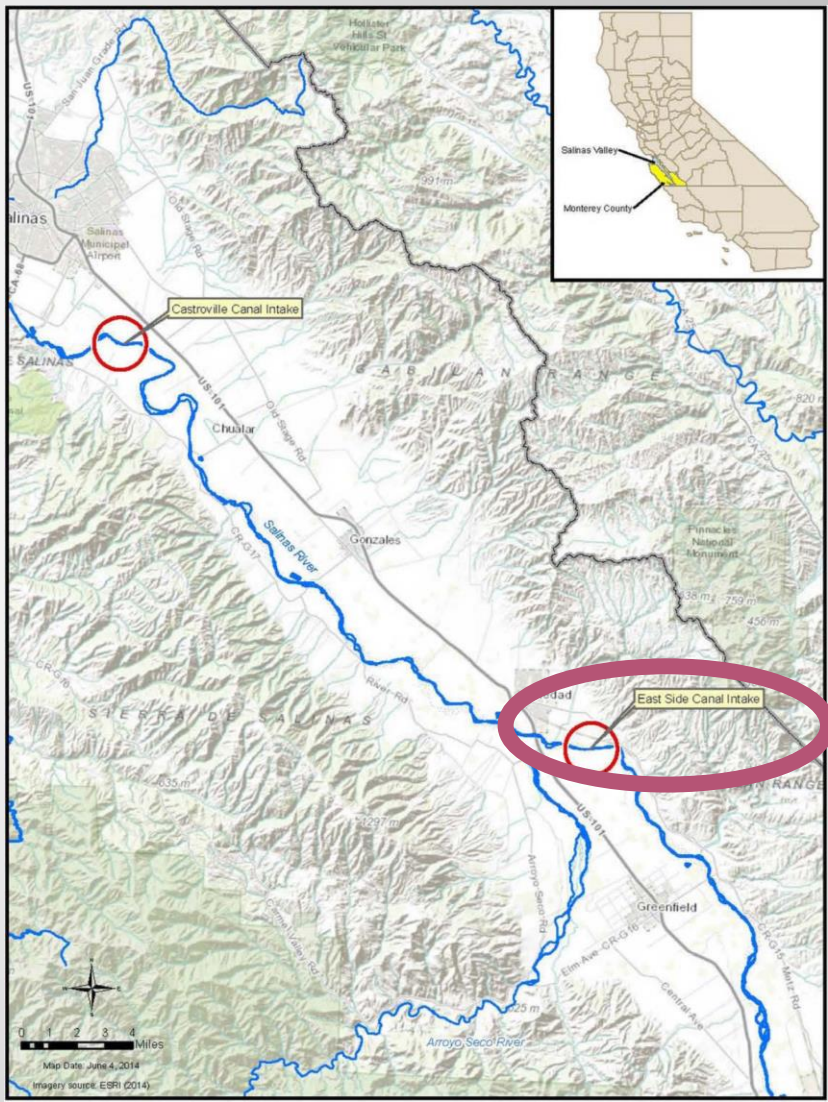
7. 11043 Diversion at Chualar

- **Description:** This project proposes constructing extraction facilities at the Chualar location and pumping the water to the Eastside Subbasin where the water can be infiltrated into the groundwater basin at known pumping depressions and areas of poor water quality.
- **Project Benefit**: Average of approximately 8,000 AF/yr. diverted, but highly variable. Benefits include increased groundwater elevations in vicinity of recharge/reduced extraction, increased groundwater in storage
- **Capital cost**: estimated at at $60,578,000. Including O&M and annualized, results in estimated $880/AF



8. 11043 Diversion at Soledad

- **Description:** This project proposes constructing extraction facilities at the Soledad location and pumping the water to the Eastside Subbasin where the water can be infiltrated into the groundwater basin at known pumping depressions and areas of poor water quality.
- **Project Benefit**: Average of approximately 8,000 AF/yr. diverted, but highly variable. Benefits include increased groundwater elevations in vicinity of recharge/reduced extraction, increased groundwater in storage
- **Unit Cost**: estimated at $127,838,000. Including O&M and annualized, results in estimated $1,460/AF



9. Salinas Scalping Plant

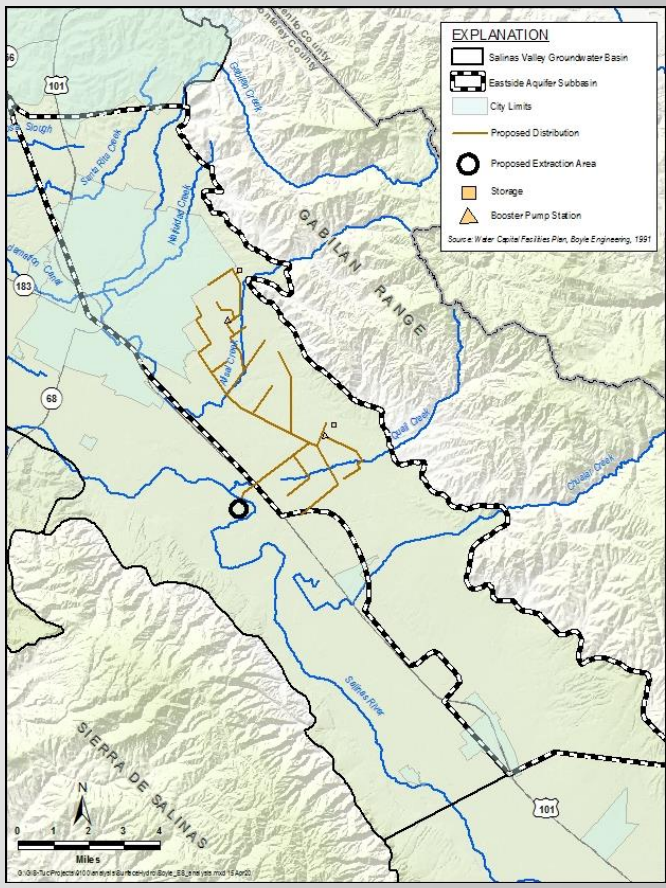
- **Description:** This project building a scalping plant for the future growth area on the east side of Salinas.
- **Project Benefit and Cost**: The benefits include in-lieu recharge, and increased groundwater elevations and storage.
  - 250,000 gallon per day (gpd) scalping plant generates 280 AF/yr.

  With a capital cost of $9,839,000, the unit cost is $6,480/AF
  - 500,000 gpd scalping plant generates 560 AF/yr.

  With a capital cost of $14,183,000, the unit cost is $4,730/AF

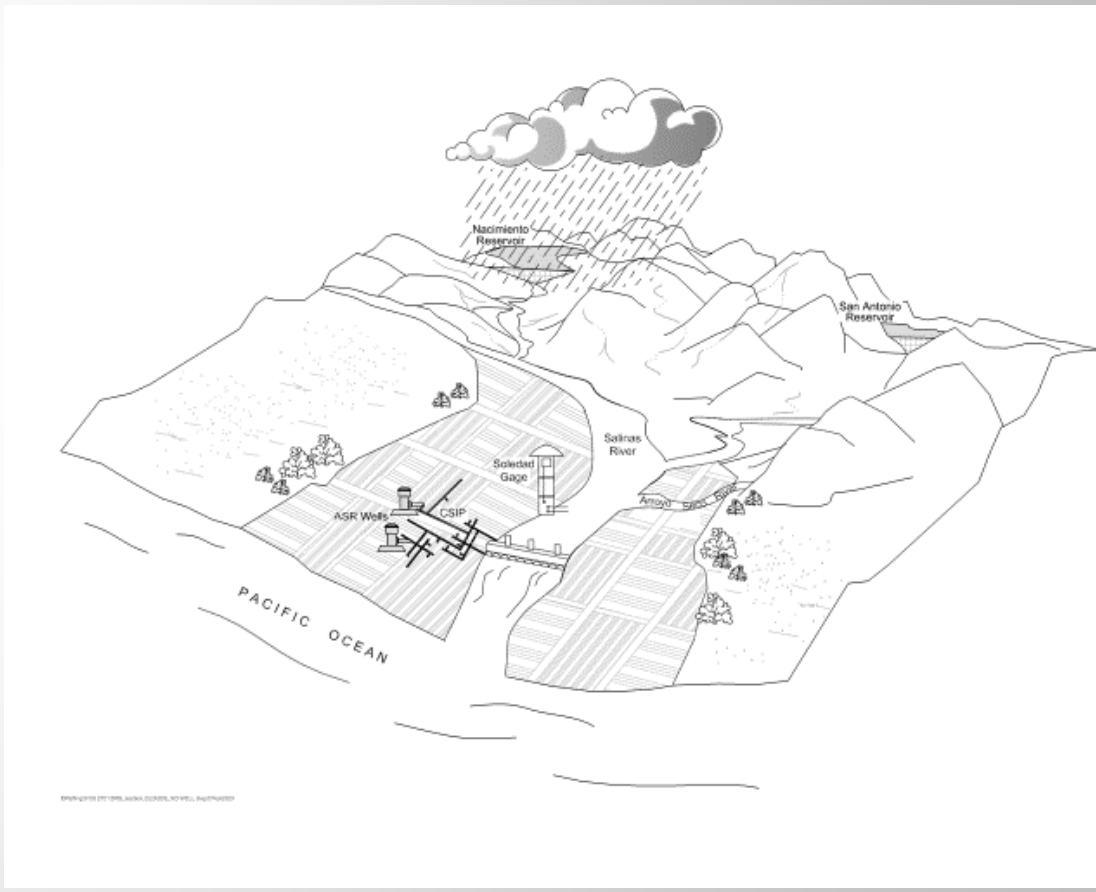
10. Eastside Irrigation Project (Somavia Road)

- **Description:** This project consists of pumping 3,000 AF/yr. from the 180-Foot Aquifer in the 180/400-Foot Aquifer Subbasin from an existing irrigation well, or series of wells on the southwest side of the Salinas River, and sending it through the same proposed distribution system for irrigation or recharge.
- **Project Benefit**: The primary benefit from this project is increased groundwater elevations from reduced subbasin pumping and in-lieu use of imported water.
- **Capital Cost**: estimated at $139,928,000. Including O&M and annualized, unit cost is estimated at $3,980/AF



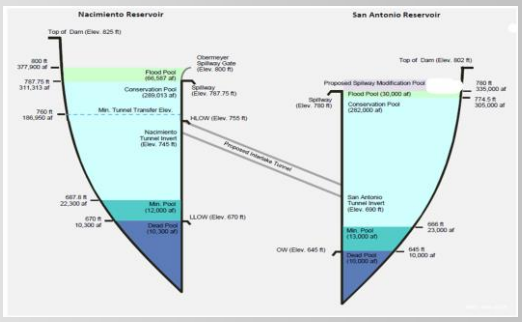
11. Winter Releases from Reservoirs, with Aquifer Storage and Recover in the 180/400-Foot Aquifer Subbasin

- Shift summertime conservation releases to winter reservoir releases
- Diverts 13,000 AF at SRDF in winter months
- 16 ASR injection wells in the 180/400 Subbasin
- Release reservoir releases every winter
- CSIP customers extract injected water in summertime
- **Project Benefit:** greater recharge to aquifers, ability to maximize SRDF diversion, more water for CSIP and beneficial users, reduction in seawater intrusion, more consistent winter releases, reduced evapotranspiration



12. Interlake Tunnel and Spillway Modification

- **Description:** Consists of design, permitting, construction, and maintenance of a tunnel for diversion of water from the Nacimiento Reservoir to the San Antonio Reservoir
- **Project Benefit**:
  - Increase the average total water in storage in the reservoirs by 39,000 AF/yr.
  - Increase the number of operational days for the SRDF and the total volume of groundwater recharge throughout the Valley.
  - Increase average annual conservation releases by 34,300 AF/yr.
  - Increase groundwater recharge by approximately 30,500 AF/yr.

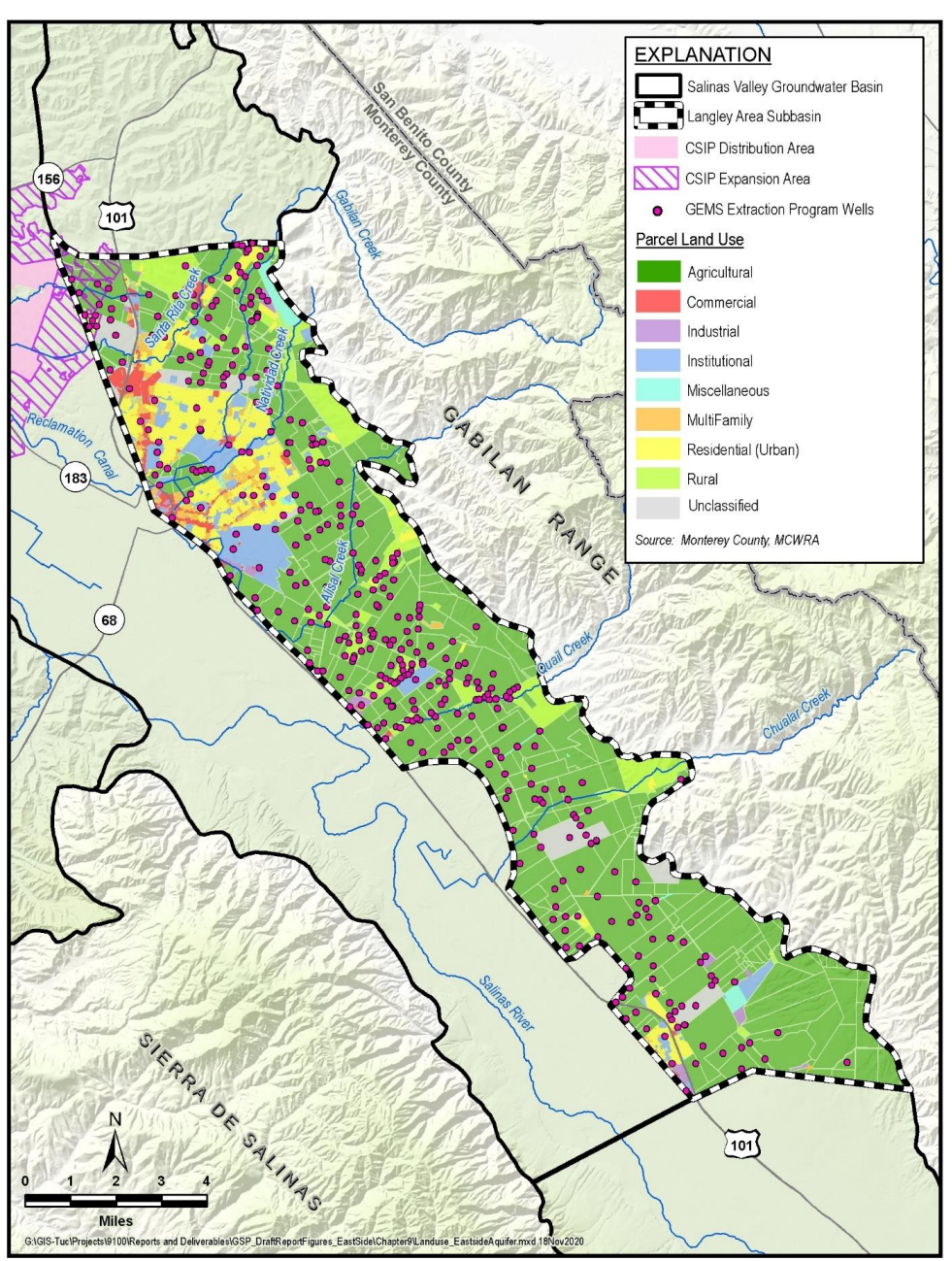


13. Drought Reoperation

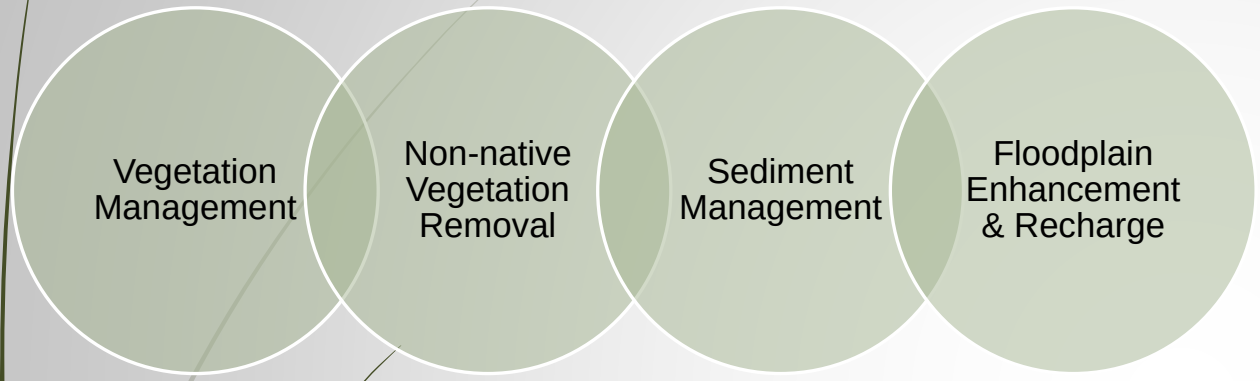
- **Description:** MCWRA formed a Drought Operations Technical Advisory Committee (D-TAC) to provide, when drought triggers occur, technical input and advice regarding the operations of Nacimiento and San Antonio Reservoirs. The D-TAC developed Standards and Guiding Principles to be used in the development of a proposed reservoir release schedule triggered under specific, seasonally defined conditions. This management action would result in decisions on reservoir operation and flow releases during a drought.
- **Project Benefit**: The groundwater-related expected benefits are increased groundwater elevations in the vicinity of the river channel due to increased infiltration and percolation to the principal aquifers during times of drought.

14. CSIP Expansion

- **Description:** This project would expand CSIP into agricultural land in or adjacent to the Eastside Subbasin and could reduce the amount of groundwater pumped from the Subbasin.
- **Project Benefit**: Expanding CSIP to land outside of the Eastside Subbasin may still have positive impacts on groundwater elevations within the Eastside Subbasin.



15. Multi-benefit Stream Channel Improvements



- Component 1. Stream Maintenance
- Component 2. Invasive Species Removal
- Component 3. Floodplain Enhancement and Recharge

- Targeted, geomorphically-informed stream maintenance and floodplain enhancement can improve stream function both morphologically and biologically.
- **Project benefits** include increased groundwater elevations near river channel, increased water availability, flood risk reduction, reduced velocities during high flows to lessen bank and levee erosion, decreased evapotranspiration, improved conditions for wildlife, and enhanced infiltration

16. Support protection of areas of high recharge

- Work with the county and other land-use entities in the region to protect the areas of the Subbasin that have been identified as areas of higher recharge potential.

17. GEMS Expansion

- SVBGSA will work with MCWRA to expand the existing GEMS Program to cover the entire Upper Valley Subbasin, which would capture all wells that have at least a 3-inch internal diameter discharge pipe.
- Alternatively, SVBGSA could implement a new groundwater extraction reporting program that collects data outside of MCWRA Zones 2, 2A, and 2B.
- Additional improvements to the existing MCWRA groundwater extraction reporting system may include some subset of the following:
  - Develop a comprehensive database of extraction wells
  - Expanding reporting requirements to all areas of the Salinas Valley Groundwater Basin
  - Including all wells with a 2-inch discharge or greater
  - Requiring automatically reporting flow meters
  - Comparing flow meter data to remote sensing data to identify potential errors and irrigation inefficiencies.

18. Well Registration

- Require all groundwater production wells to register with the GSA to gain better understanding of existing wells and extraction.
- Meters must be calibrated on a regular schedule in accordance with manufacturer standards and any programs developed by the GSAs, or existing programs of the WRA.
- Although *de-minimis* pumpers must register their wells, SGMA exempts them from metering requirements.

19. Domestic Water Partnership

- SVBGSA will play a convening role by developing and coordinating a working group on domestic water.
- The working group will review data regarding domestic water supplies, identify data gaps, and coordinate agency communication.

20. Local Groundwater Elevation Trigger

- The GSA could develop or support the development of a program to assist well owners whose wells go dry due to declining groundwater elevations.
- A mitigation program could include a notification system whereby well owners can notify the GSA or relevant partner agency if their well goes dry and referral to assistance with short-term supply solutions, technical assistance to assess why it went dry, and long-term supply solutions.
- The GSA could also set up a trigger system whereby it would convene a working group to assess the groundwater situation if the number of wells that go dry in a specific area cross a specified threshold.

Discussion on Projects and Management Actions

- **Increased Recharge**
  1. Managed aquifer recharge of overland flow
  2. Floodplain restoration program, including Gabilan Floodplain Enhancement Project
- **Decreased Demand**
  3. Conservation and agricultural Best Management Practices (BMPs)
  4. Fallowing, Fallow Bank, and Agricultural Land Retirement
  5. Pumping Management
- **New Water Supplies for Recharge or Direct Use**
  6. Surface Water Diversion from Gabilan Creek
  7. 11043 Diversion at Chualar
  8. 11043 Diversion at Soledad
  9. Salinas Scalping Plant
  10. Eastside Irrigation Water Supply Project (or Somovia Road Project)
- **Valley-Wide Projects, Including Projects that Result in Reoperation of the Reservoirs**
  11. Winter Releases with Aquifer Storage and Recovery (ASR)
  12. Interlake Tunnel and Spillway Modification
  13. Drought Reoperation
  14. Multi-Benefit Stream Channel Improvements
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- **Implementation Actions**
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  18. Domestic Water Partnership
  19. Local Groundwater Elevation Trigger
  20. Well Registration

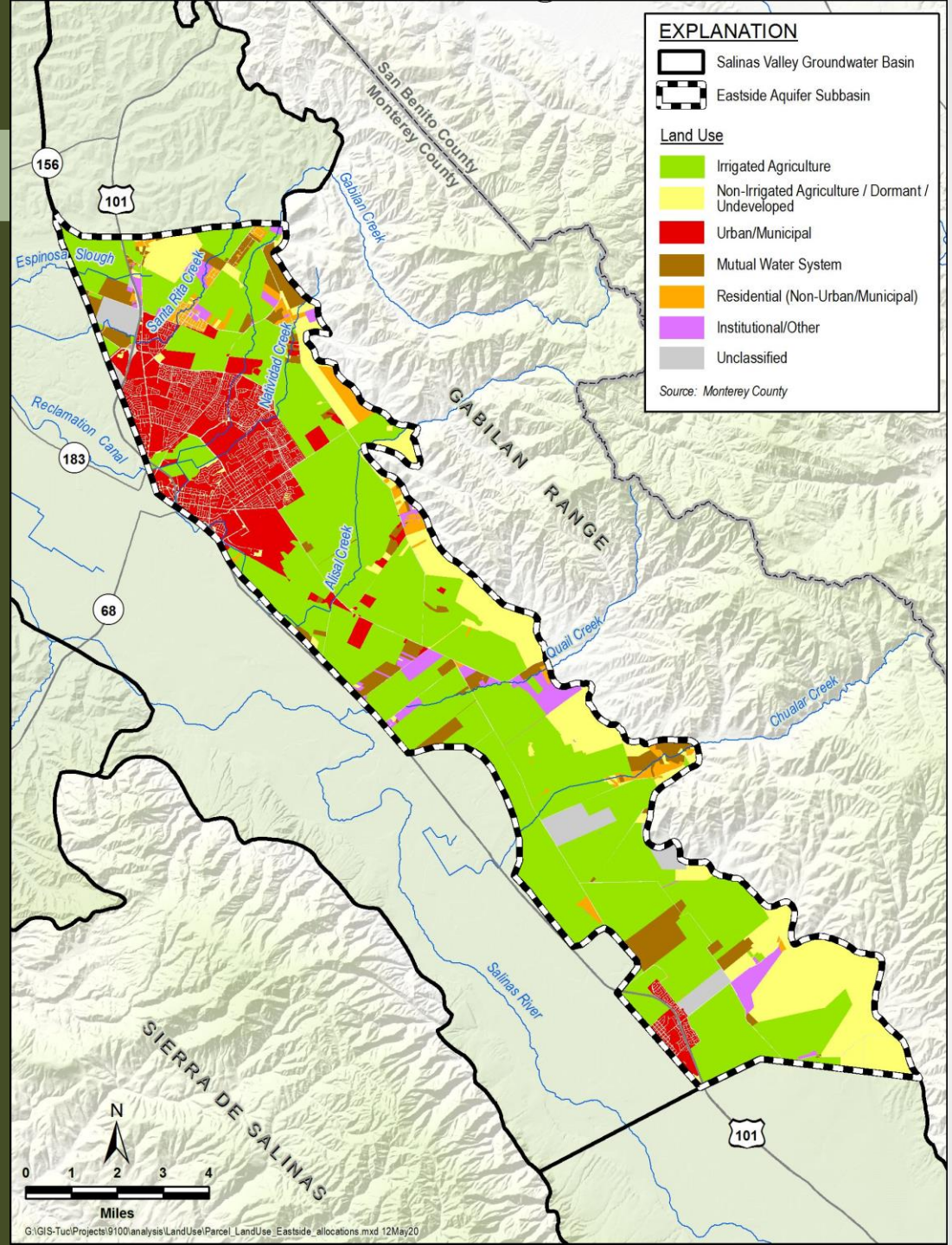
Discussion on Projects and Management Actions

Project or Management Action	Project Benefit	Cost
Managed Aquifer Recharge of Overland Flow	More overland flow enters aquifers instead of being washed out to the ocean. Growers receive extraction credits for the recharge ponds they build and for the water they redirect.	TBD
Floodplain Restoration and Stormwater Recharge	5,700 AF/yr. in increased infiltration, less erosion, less flooding	Capital Cost: $15,949,000 Unit Cost: $230/AF
Conservation and Agricultural Best Management Practices	Better informed growers use water more efficiently.	TBD
Fallowing, Fallow Bank, and Agricultural Land Retirement	Water is conserved when growers occasionally fallow some of their land. Growers receive compensation to offset lost income.	TBD but relatively low cost
Pumping Management	Water is conserved when pumping restrictions are imposed.	TBD but relatively low cost
Surface Water Diversion from Gabilan Creek	On average, 350 AF/yr. of excess streamflow is saved for later use.	Capital Cost: $5,477,000 Unit Cost: $1,800/AF
11043 Diversion at Chualar	On average, 8,000 AF/yr. of excess streamflow is saved for later use. Moderately reduces seawater intrusion in other subbasins.	Capital Cost: $60,578,000 Unit Cost: $880/AF
11043 Diversion at Soledad	On average, 8,000 AF/yr. of excess streamflow is saved for later use. Slightly reduces seawater intrusion in other subbasins.	Capital Cost: $127,838,000 Unit Cost: $1,460/AF
Salinas Scalping Plant	Recycling water for irrigation saves 280 to 560 AF/yr of groundwater.	Capital Cost: at least $10,000,000* Unit Cost: at least $4,730/AF*
Eastside Irrigation Water Supply	On average, 3,000 AF/yr. of excess streamflow is saved for later use.	Capital Cost: $139,928,000 Unit Cost: $3,980/AF

Pumping Management

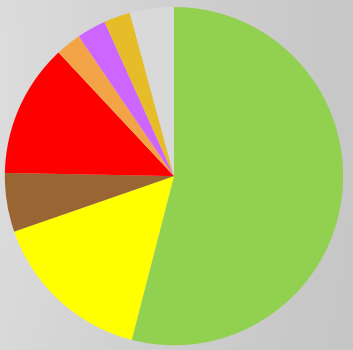
Pumping Management

- Management action to enable Subbasin to pump within sustainable yield
- Allocations are one type of pumping management
- Allocations are not water rights, but rather an approach to divide up sustainable yield among beneficial users
- They can be used to:
  - Underpin management actions that manage pumping
  - Generate funding for projects and management actions (but is not the only option)
  - Incentivize water conservation and/or recharge projects

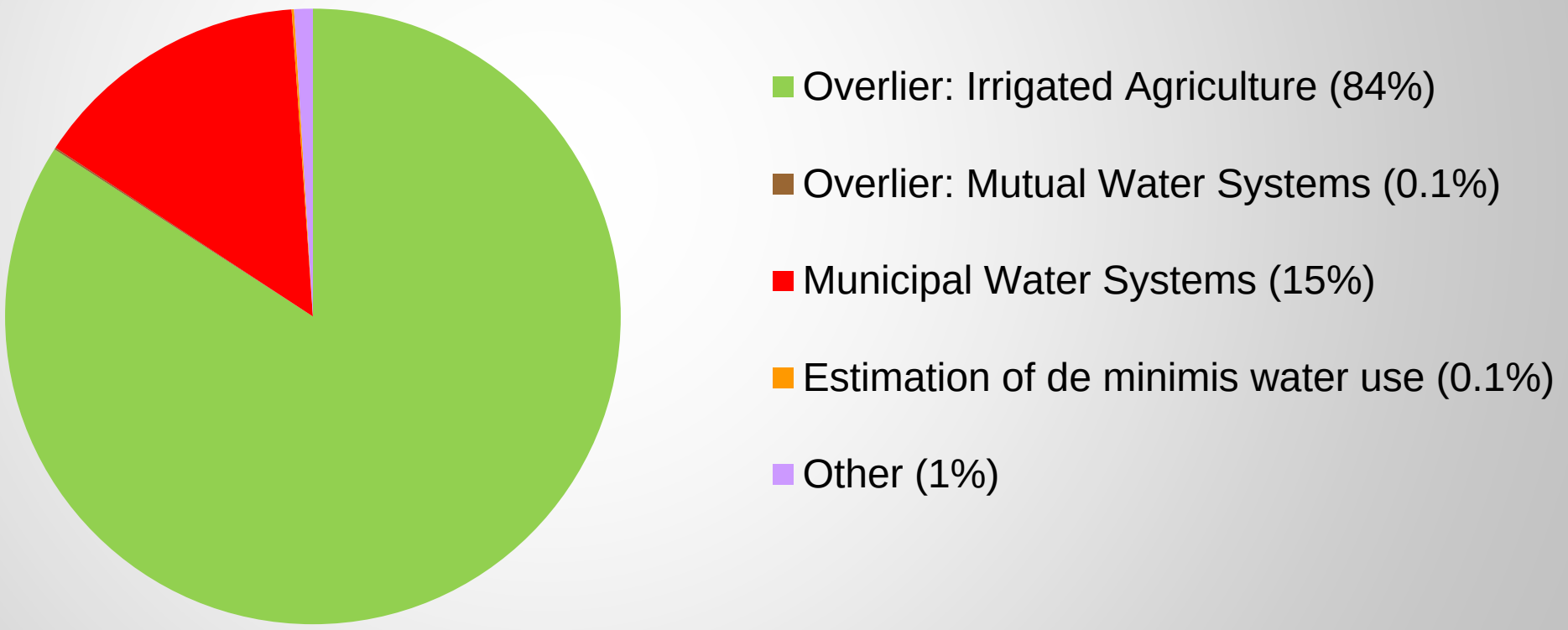


Background: Land Use

Land Use	Acres	Percent
Irrigated Agriculture	31,045	54%
Non-irrigated Ag / Vacant / Undeveloped	8,997	16%
Mutual Water Systems	3,231	6%
Urban/Municipal	7,323	13%
Residential (Non-Urban/Municipal)	1,406	2%
Institutional/Other	1,597	3%
Unclassified	1,454	3%
Not in Parcel Layer	2,414	4%
Total	**57,468**	100%



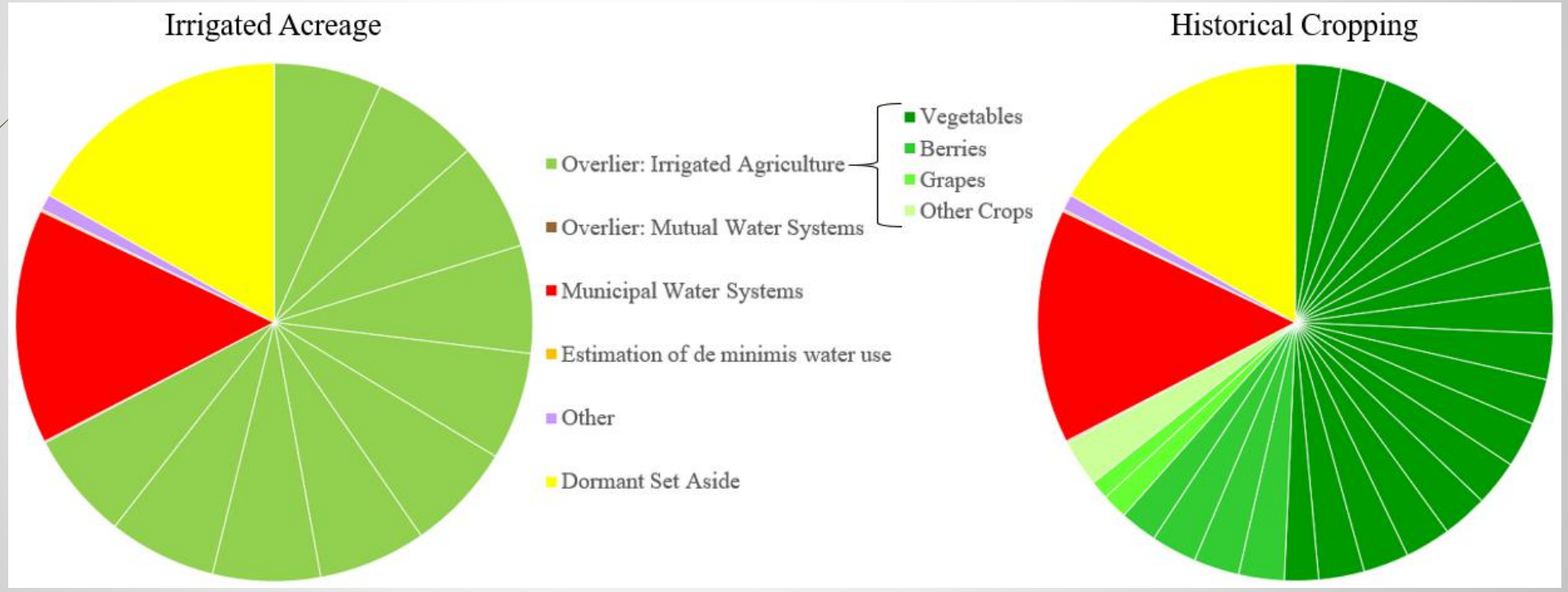
Average 2016-2018 Groundwater Extraction (GEMS data)



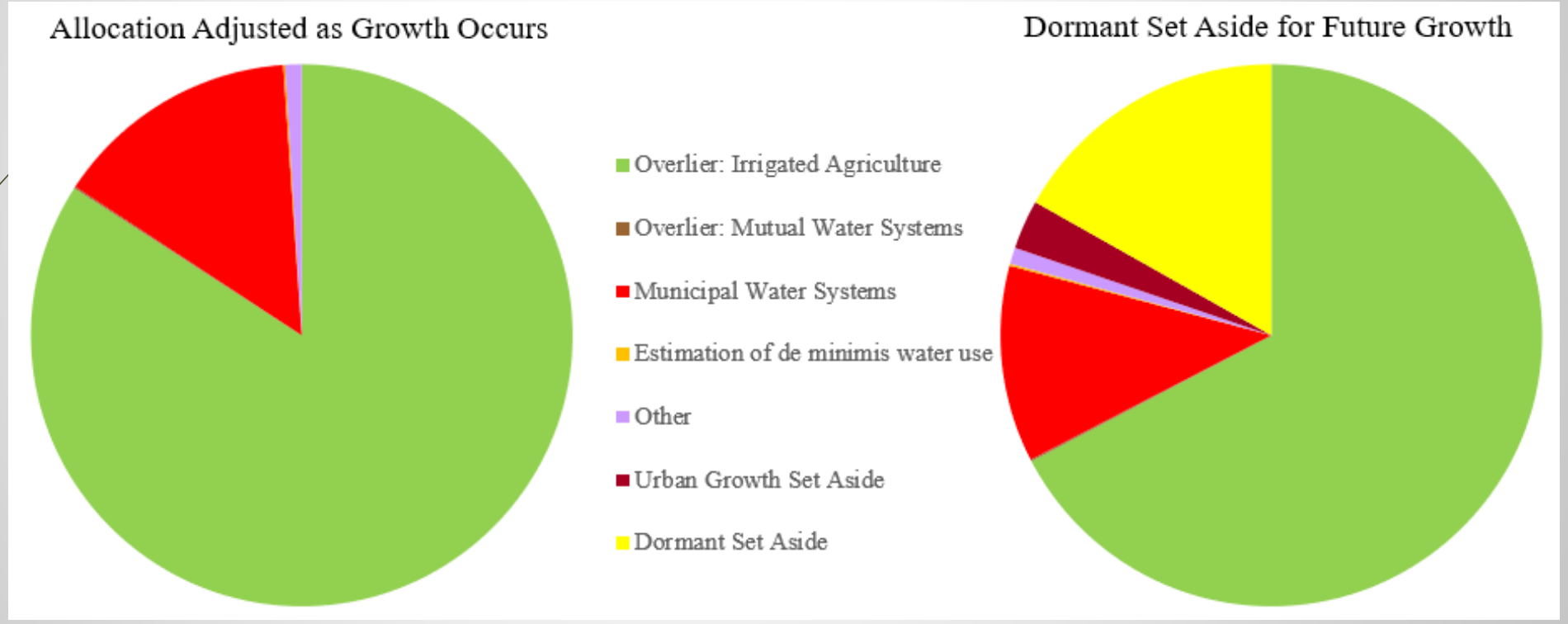
Pumping Allocations

- Are based on various criteria and facts
- Three decision points are outlined here, developed based on past input from the Eastside Subbasin Planning Committee and legal advice
- Decision points:
  - 1) How should allocations for irrigated lands occur?
  - 2) How should urban and irrigated agricultural growth be planned for?
  - 3) What occurs when pumping has to be reduced to meet the sustainable yield?

Decision Point 1: How should allocations for irrigated lands occur?

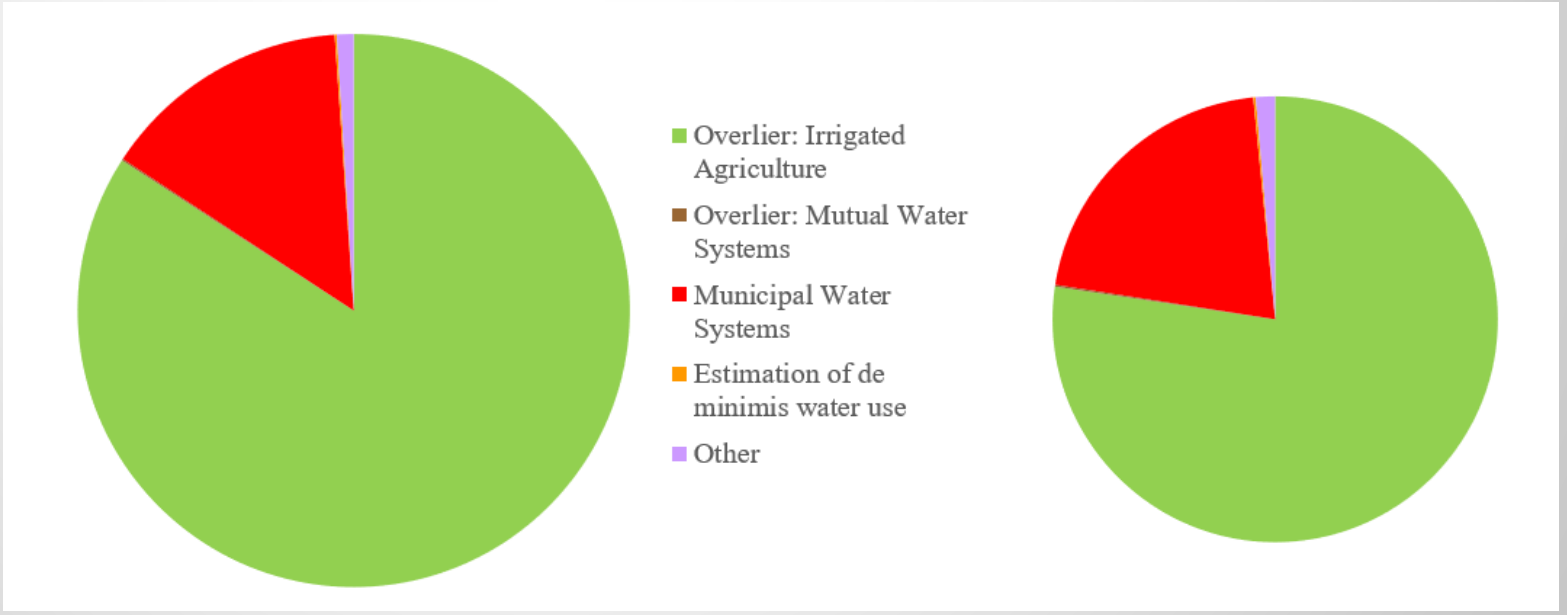


Decision Point 2: How should urban and irrigated agricultural growth be planned for?



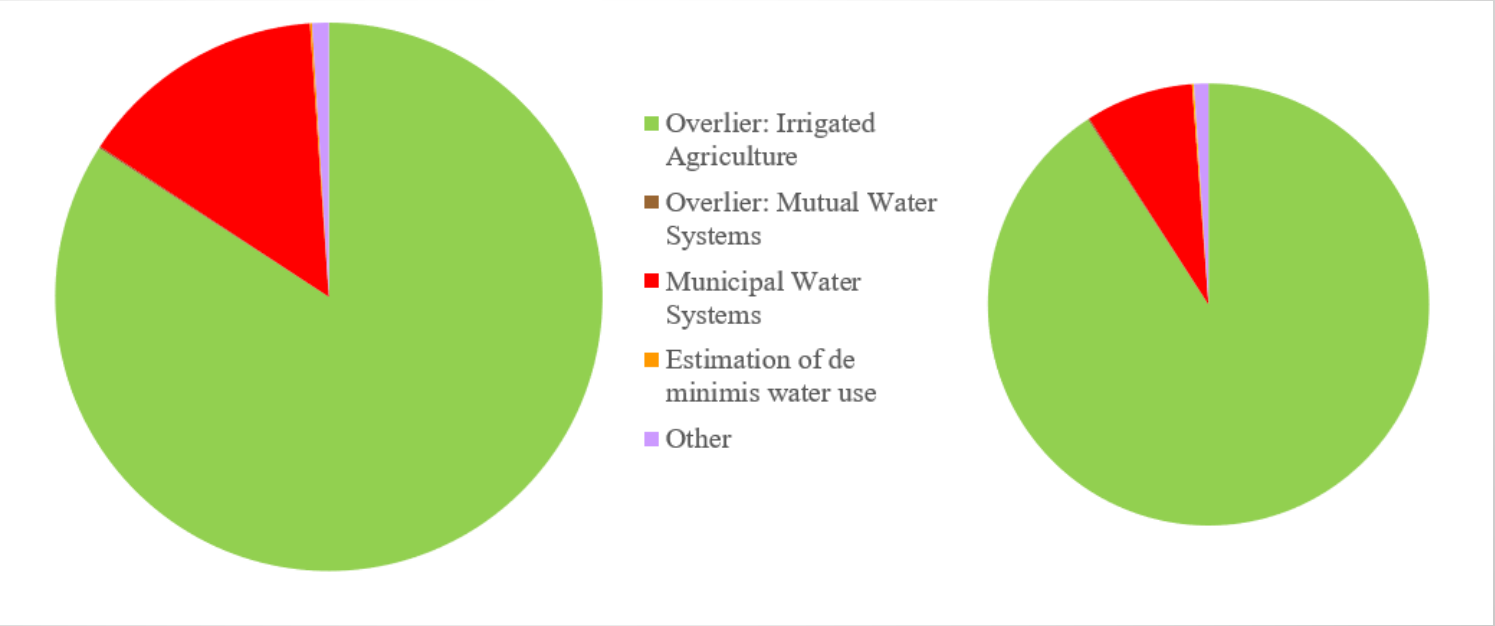
Decision Point 3. What occurs when pumping has to be reduced to meet the sustainable yield?

Option A. Drinking Water Systems have Priority



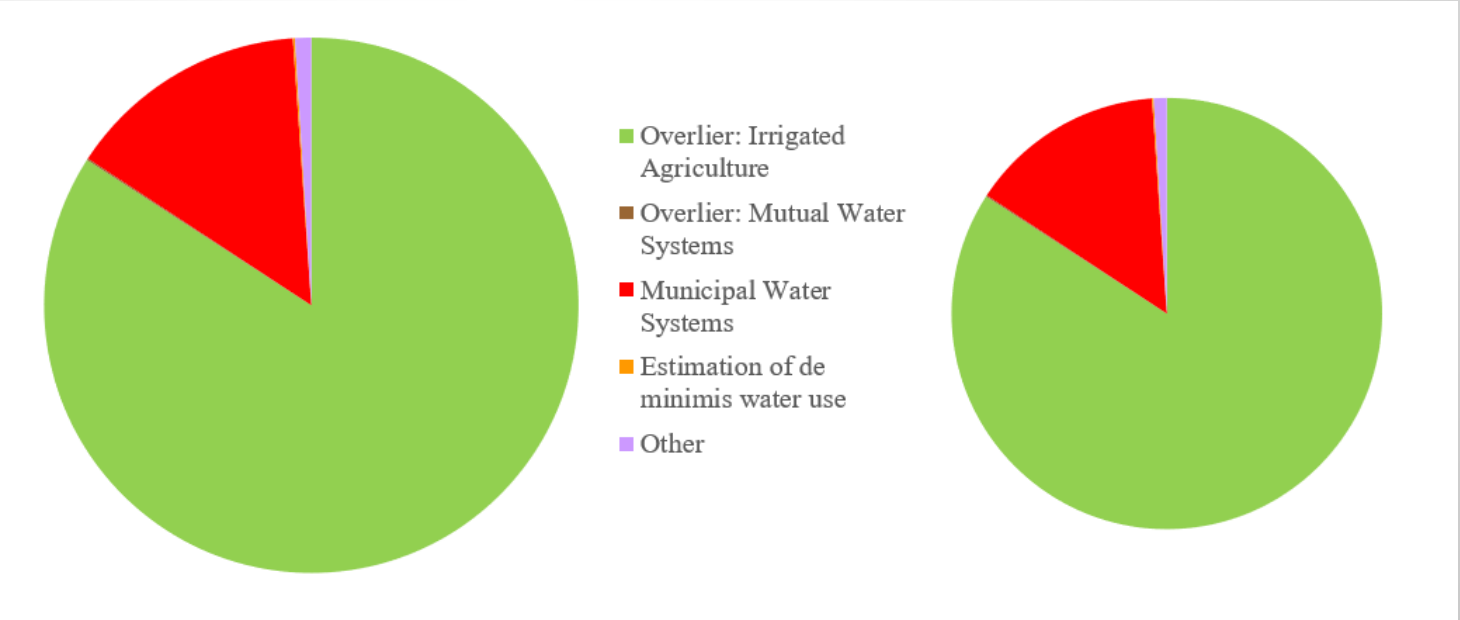
Decision Point 3. What occurs when pumping has to be reduced to meet the sustainable yield?

Option B. Overliers have Priority



Decision Point 3. What occurs when pumping has to be reduced to meet the sustainable yield?

Option C. Correlative Reduction



Pumping Allocations – Decision Points

- 1) How should allocations for irrigated lands occur?
  - Irrigated Acreage
  - Historical Cropping
- 2) How should urban and irrigated agricultural growth be planned for?
  - Allocations adjusted as growth occurs
  - Dormant set asides for future growth
- 3) What occurs when pumping has to be reduced to meet the sustainable yield?
  - Drinking water systems have priority
  - Overliers have priority
  - Correlative reduction

Questions