



IDAHO
Water Resource Board



Rathdrum Prairie Future Water Demand Study

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Future Water Demand

- Regional water-demand projected as part of Comprehensive Aquifer Management Plan (CAMP) Process
 - 50 year planning horizon
 - Demand projected to evaluate adequacy of future supply
 - Evaluate potential impacts of climate variability and conservation on water demand and supply

RATHDRUM PRAIRIE AQUIFER WATER DEMAND PROJECTIONS

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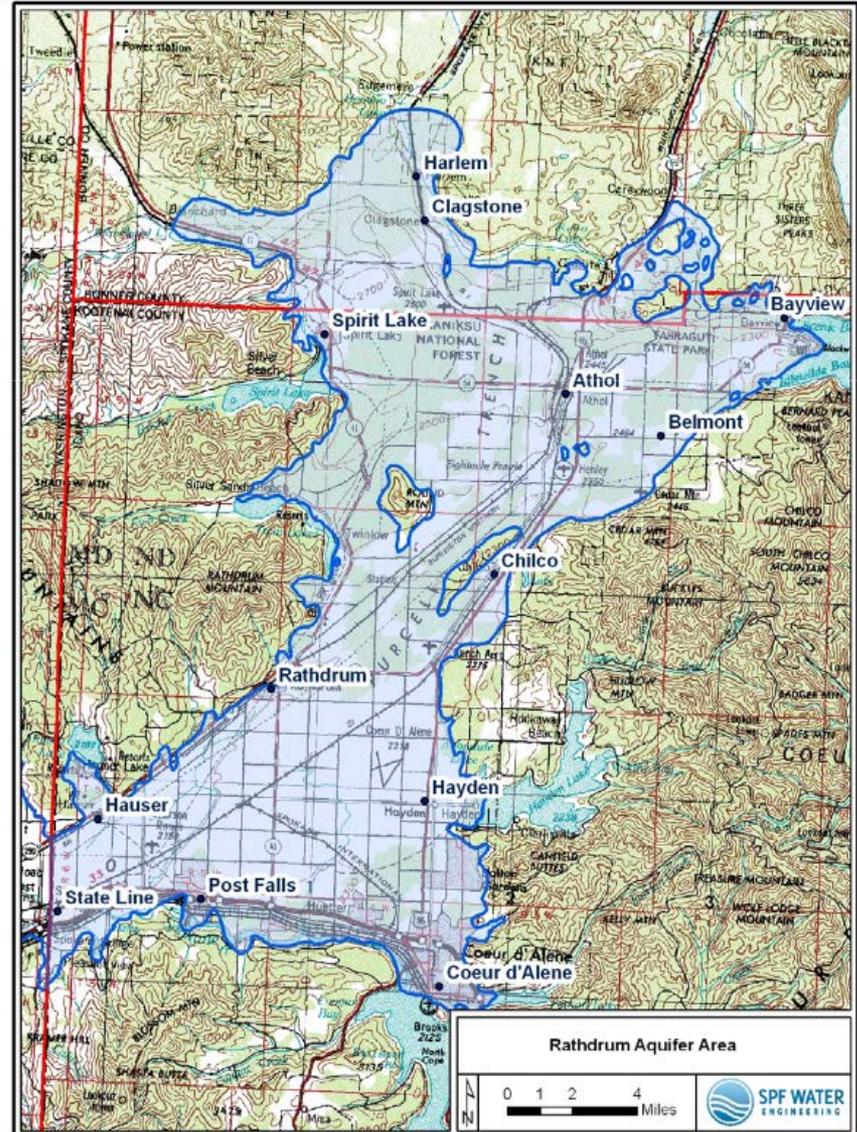
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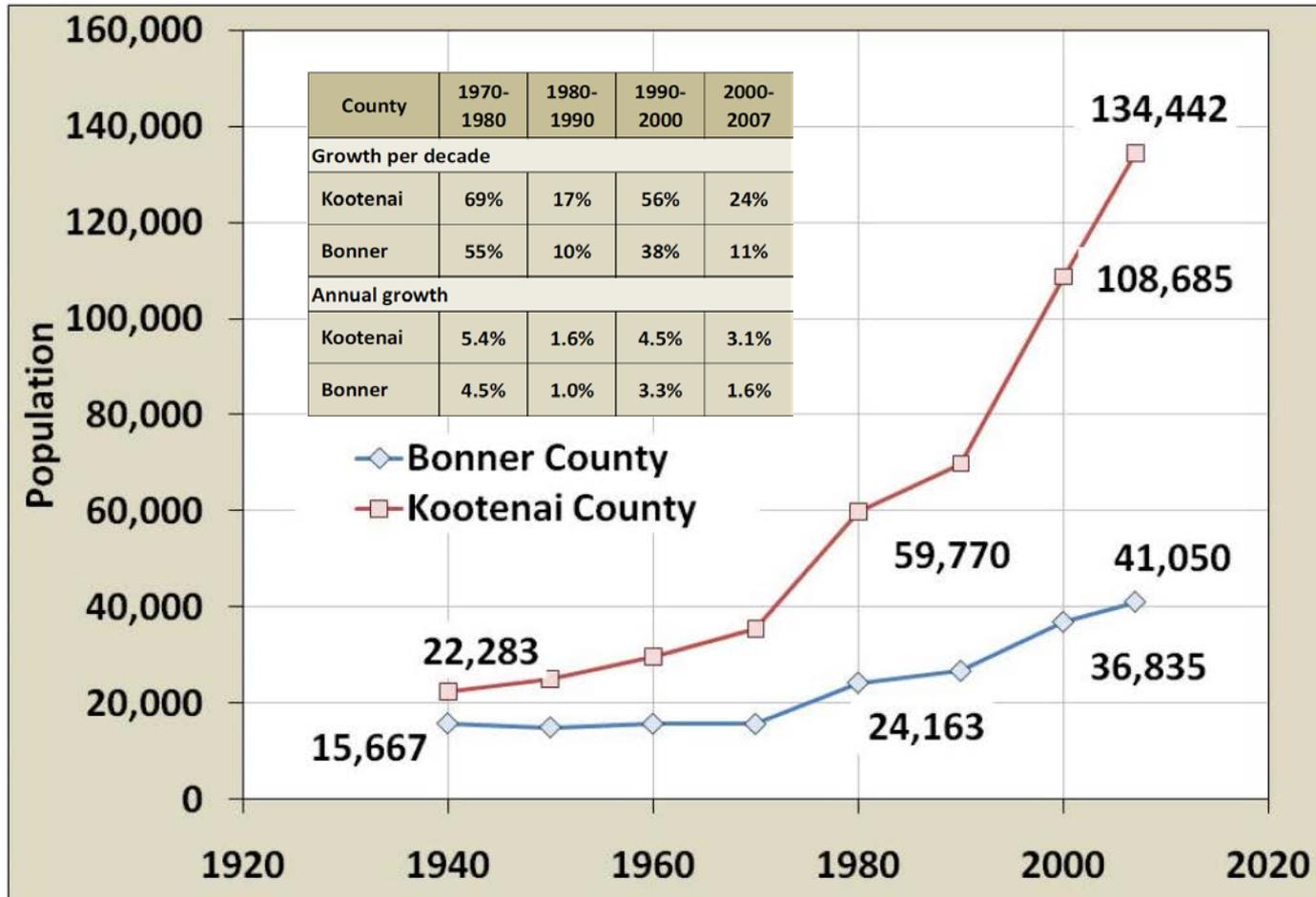
Rathdrum Prairie Aquifer Water- Demand Projection Area



Approach to Projecting Water Demand

- Review historic population trends
- Estimate current water demand (by sector ~2009)
- Review climate projections
- Evaluate conservation potential
- Project future population and employment growth
- Project future water demand
 - Developed “water-demand scenarios” to evaluate possible future water-demand outcomes that take into account various population growth rates, levels of water conservation, and the potential impact of climate variability
 - Developed water-demand data sets and a forecasting tool (i.e., spreadsheet) for use by IDWR and the IWRB to refine projections as new information becomes available

Review of historic population trends



Estimates of current water use (~2009)

Sector	Non-irrigation Use (AFA)	Irrigation Use (AFA)	Total Use (AFA)
Community public water systems	15,700	18,730	34,430
Self-supplied domestic	2,150	6,650	8,800
Self-supplied commercial and industrial	4,220	Assumed negligible	4,220
Agriculture	Assumed negligible	24,700	24,700
Estimated total ground water diversion	22,070	50,080	72,150
Estimated total consumptive use	3,370	35,060	38,430

^[1] Excludes an estimated 2,130 AF diverted and re-injected for use in heating and cooling systems.

^[2] Consumptive use for non-irrigation is assumed to be 10% for community water systems, 5% for self-supplied domestic, and 40% for self-supplied commercial and industrial.

^[3] Consumptive use for irrigation is assumed to be 70% of total use.

Climate Variability

- Water supply and demand are influenced by changes in Climate
- Changes in temperature and precipitation are expected to accelerate from the 20th century trends
- More warming in summer than winter
- Extreme heat and precipitation events may increase in frequency
- Snowpack and precipitation patterns may result in earlier runoff and more winter precipitation as rain
- Summer irrigation requirements may increase:
 - Expect up to 6% increase in evapotranspiration per °C increase
 - Study assumed a 10% increase in future irrigation demand (could range from 5% to 20%)

Water Conservation

The following three future water-demand conditions were used to evaluate potential water savings in the Rathdrum Prairie Aquifer area:

1. No conservation – i.e., no measures or programs are implemented throughout the study period. Continued “status quo” water use was assumed. *~190 gpd/home*
2. Intermediate conservation – only voluntary water conservation measures and programs are implemented and continuation of current plumbing codes occurs throughout the study period. *~113 gpd/home*
3. Aggressive conservation – water conservation programs are implemented with government-mandated measures that require maximum efficiency fixtures, appliances and other water saving behaviors (above and beyond current plumbing codes). *~82 gpd/home*

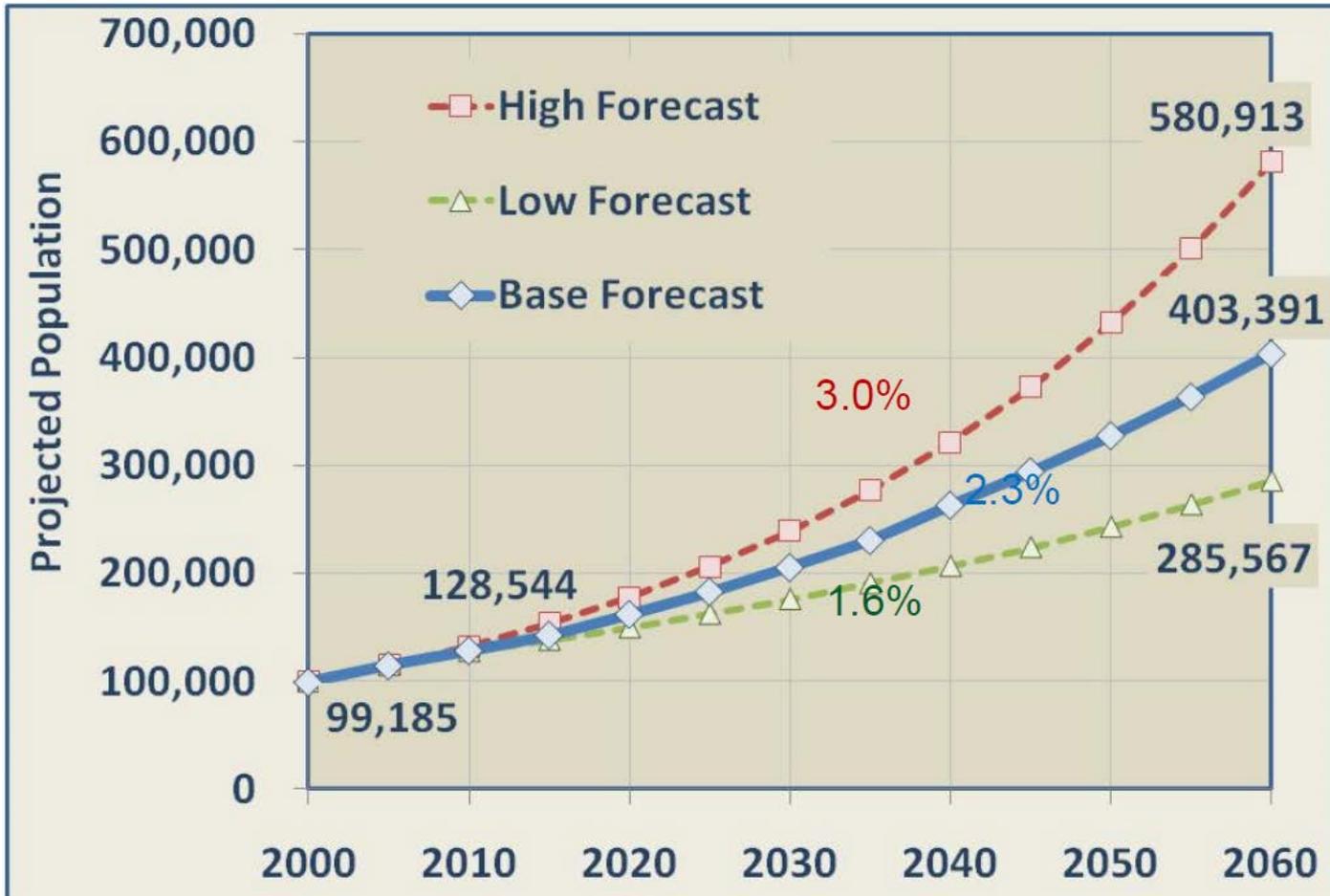
Developing Growth Projection Scenarios

- External Factors – local policies have limited influence
 - Population growth
 - Economic growth
 - Climate variability
- Local Factors – local public policy and private incentives can have substantial influence
 - Local water-use policy
 - Water availability
 - Water conservation

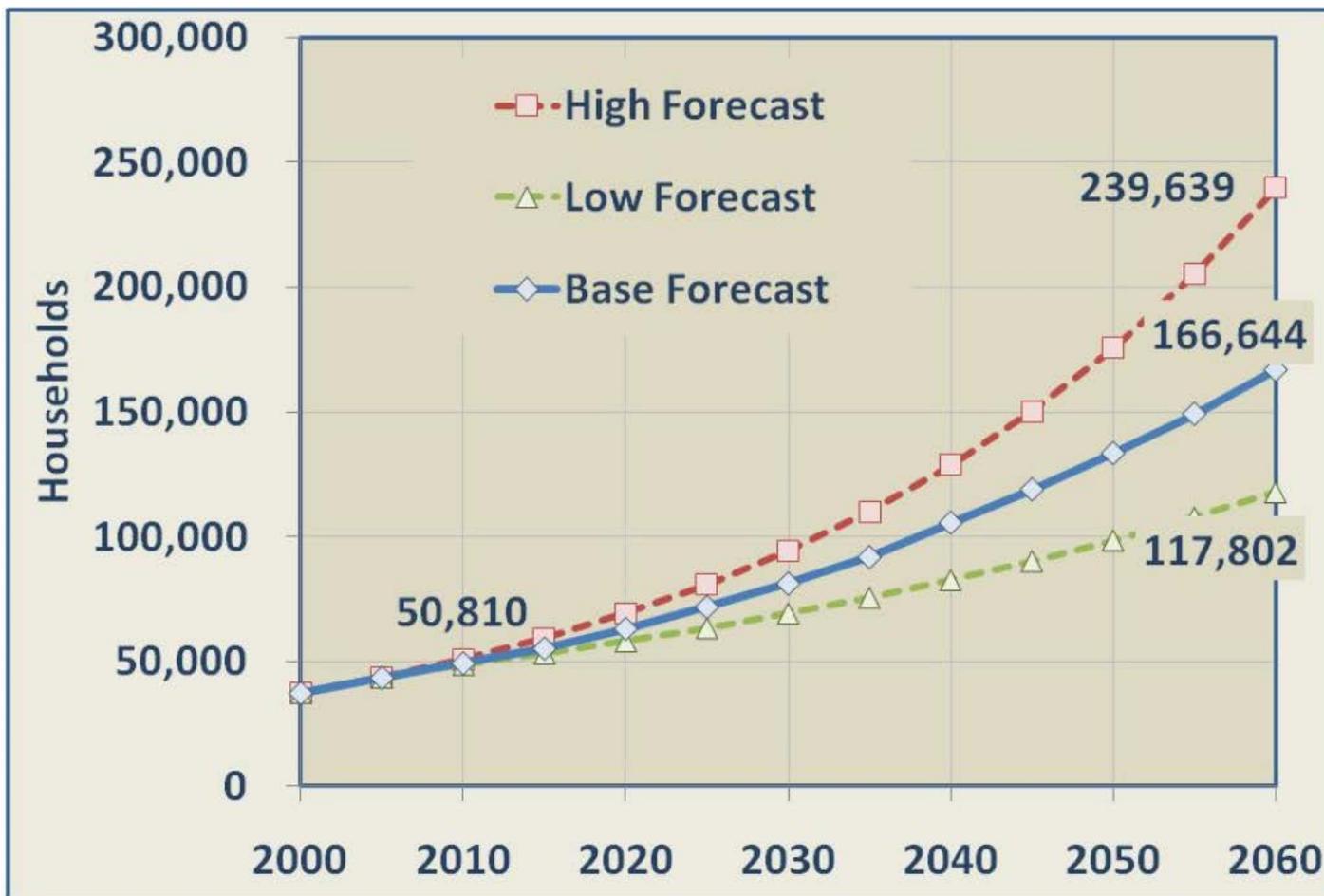
Future Water Demand Scenario Matrix

Scenario Matrix		External Realm (Population and economic growth, climate variability)		
		Low Growth	Baseline Growth	High Growth
Policy Realm (Conservation level and implementation rate)	No Conservation	Scenario 1a	Scenario 2a	Scenario 3a
	Intermediate Conservation	Scenario 1b	Scenario 2b	Scenario 3b
	Aggressive Conservation	Scenario 1c	Scenario 2c	Scenario 3c

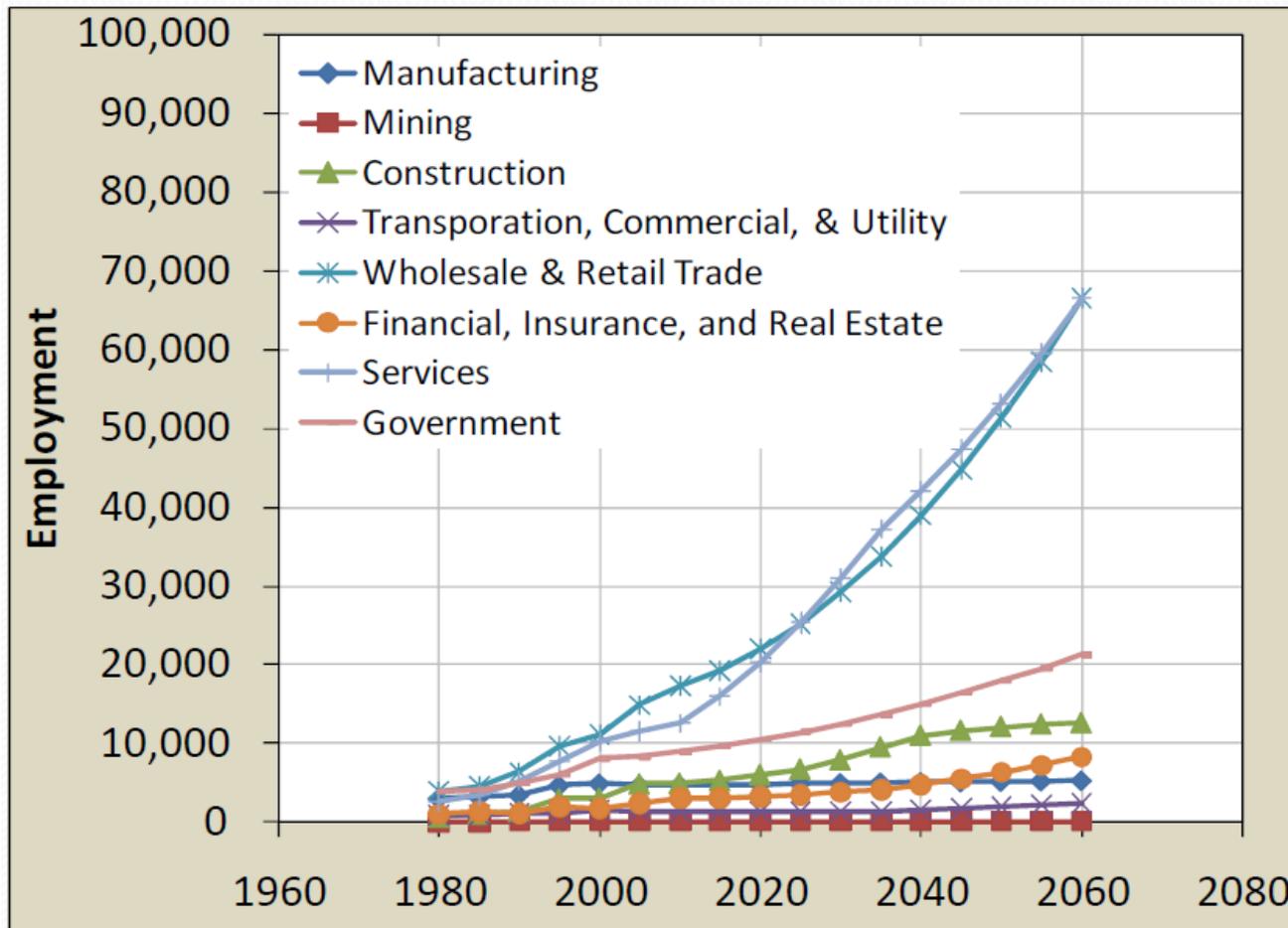
Rathdrum Prairie Population Forecast



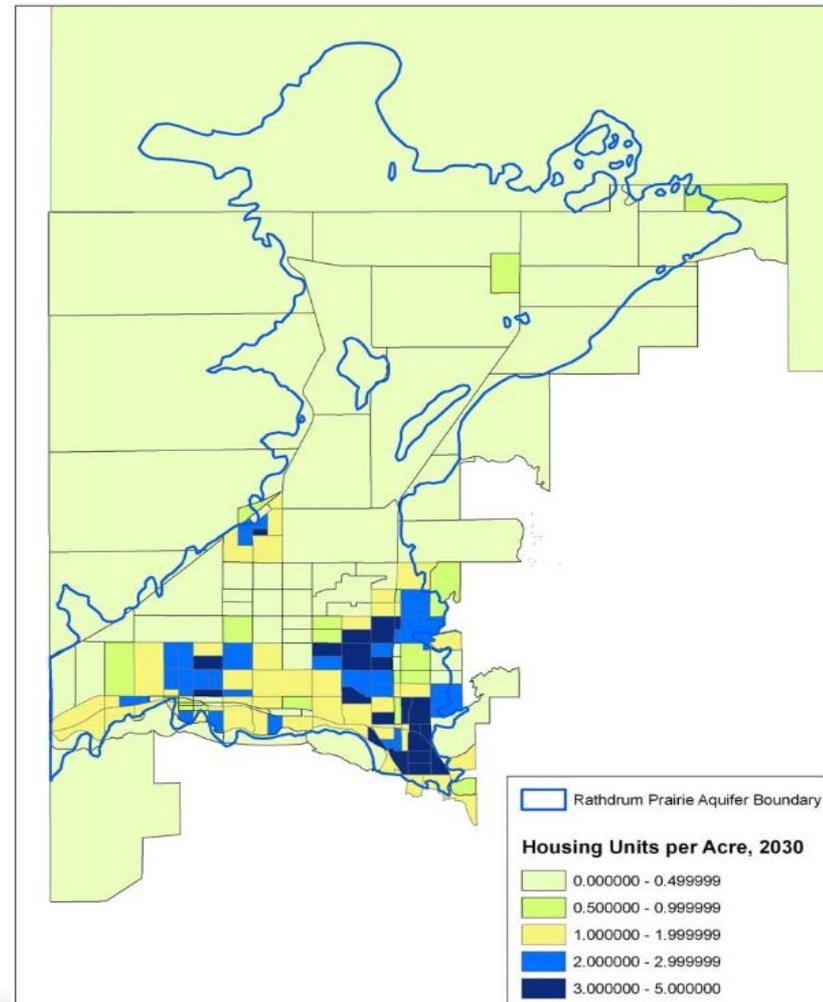
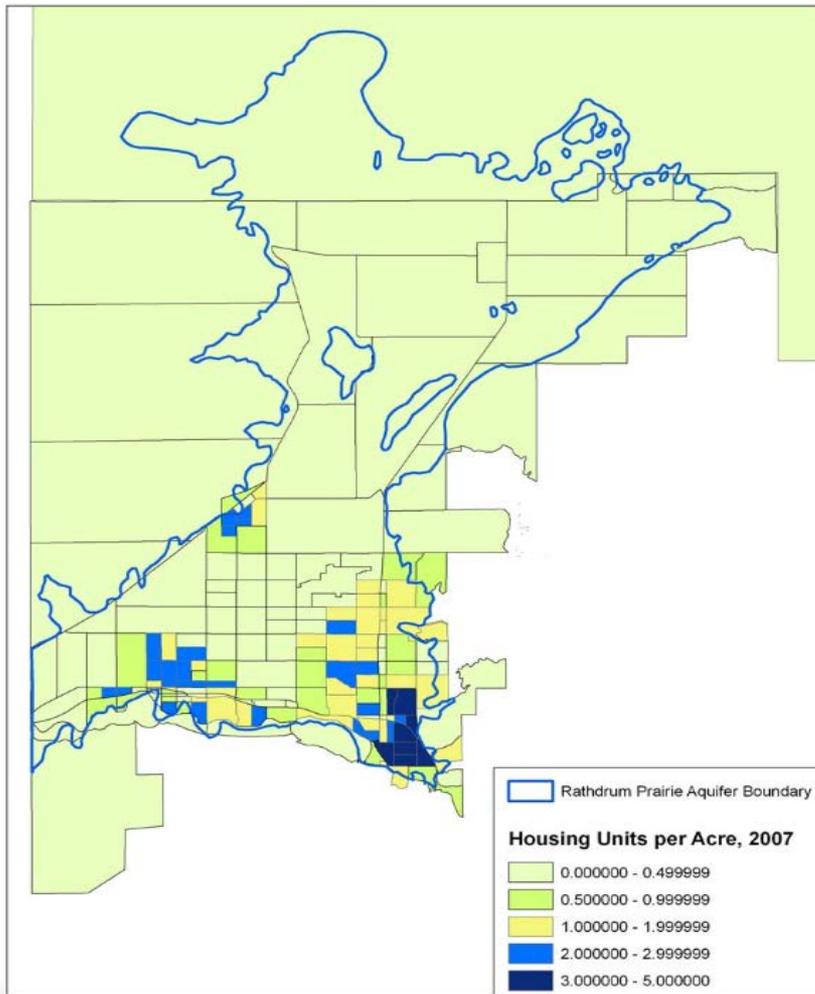
Rathdrum Prairie Household Forecast



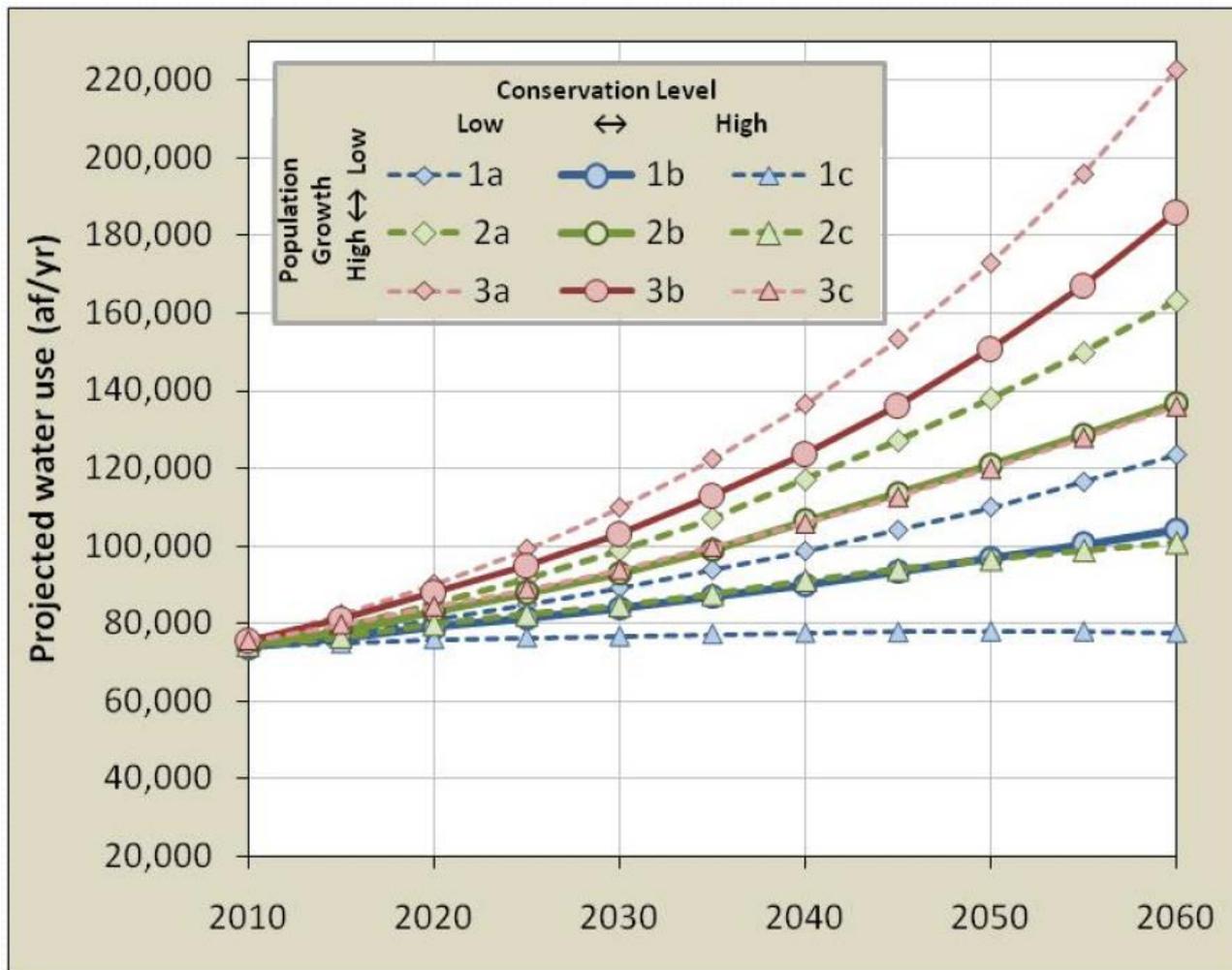
Employment Forecast (baseline – Scenario 2)



Population Distribution and Density



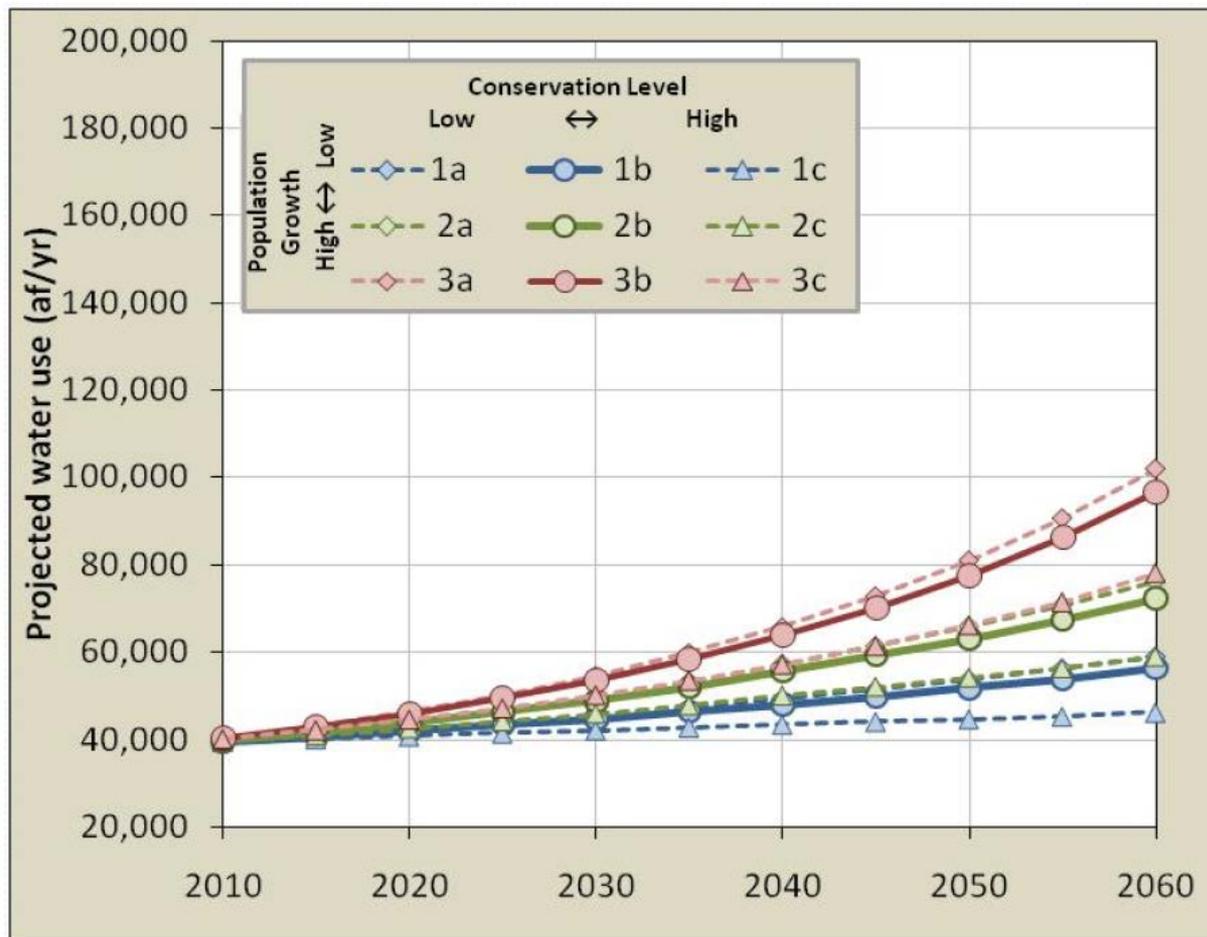
Future Water Demand



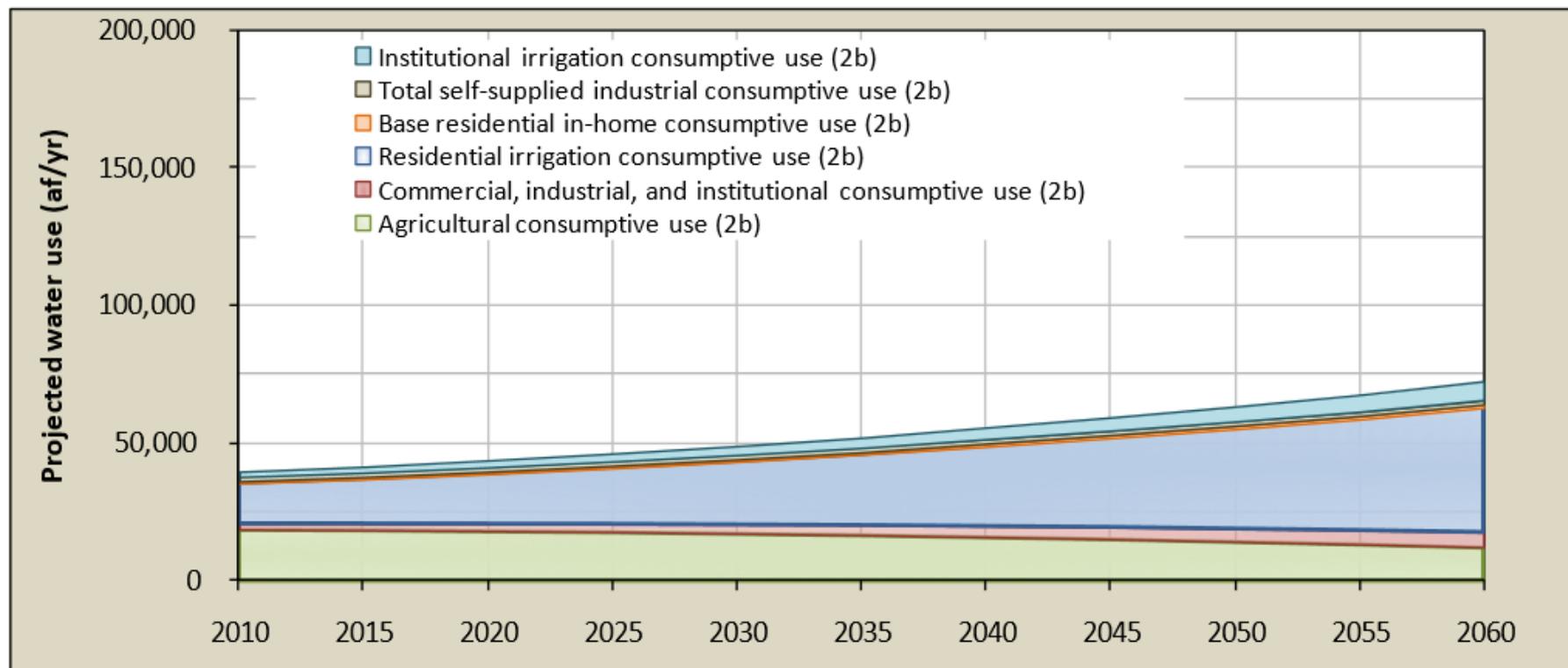
Consumptive vs. Non-Consumptive Demand

- Consumptive use: water is lost from hydrologic system
 - Example: Irrigation, manufacturing
- Non-Consumptive use: water is diverted, used, and returned to hydrologic system
 - Example: Indoor domestic use

Projected Consumptive Demand



Future Consumptive Use, Scenario 2b

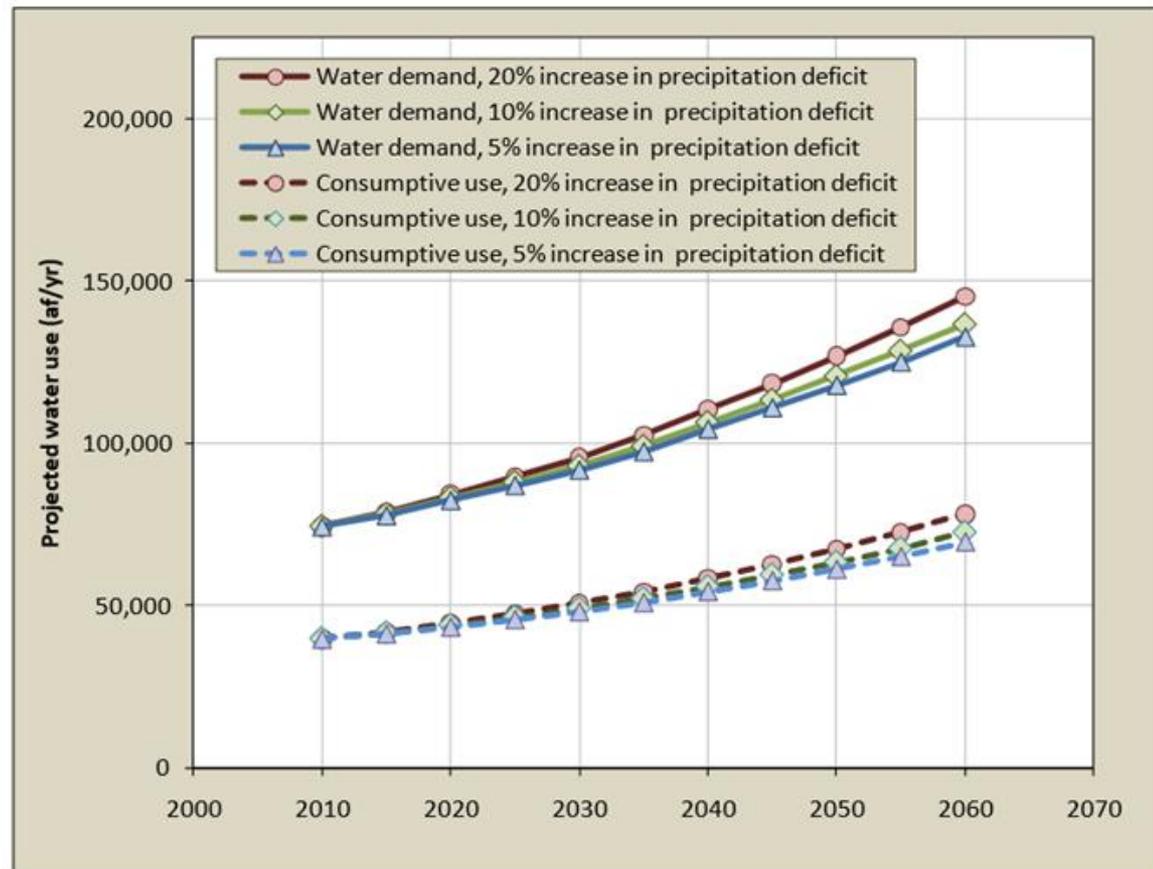


Future Water Demand-Water Right Implications

- Consumptive use represents the impacts to the aquifer
- Water Rights should provide for total diversion (for consumptive and non-consumptive use), even though portion of water is returned to the hydrologic system

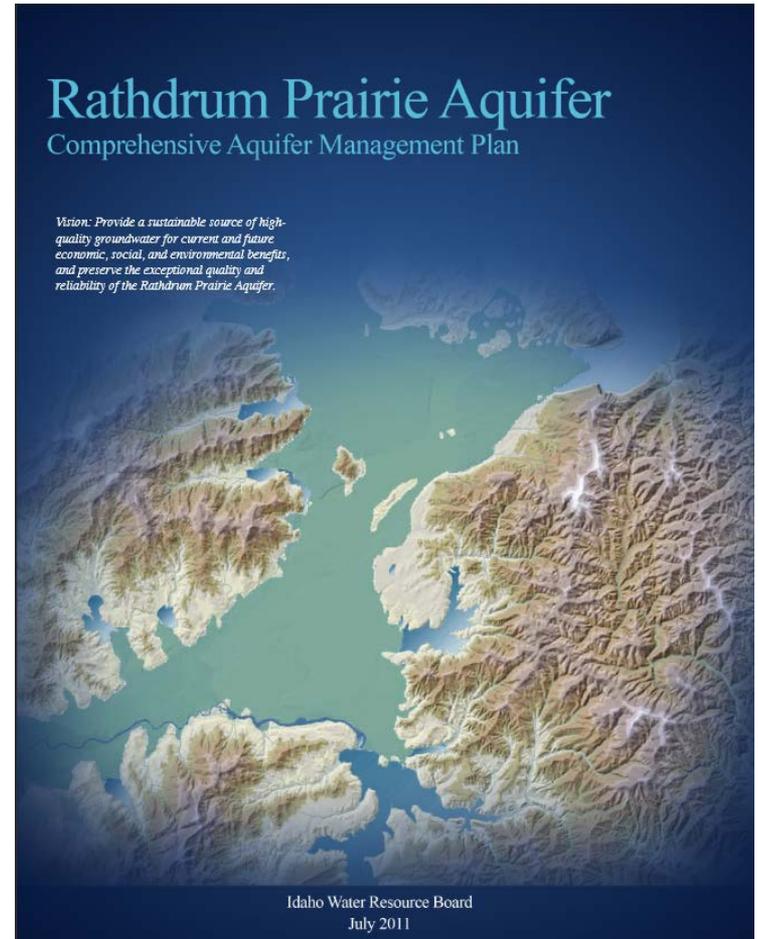
Impact of Climate Variability, Scenario 2b

- Water Supply Planning should anticipate the impacts of Climate Variability



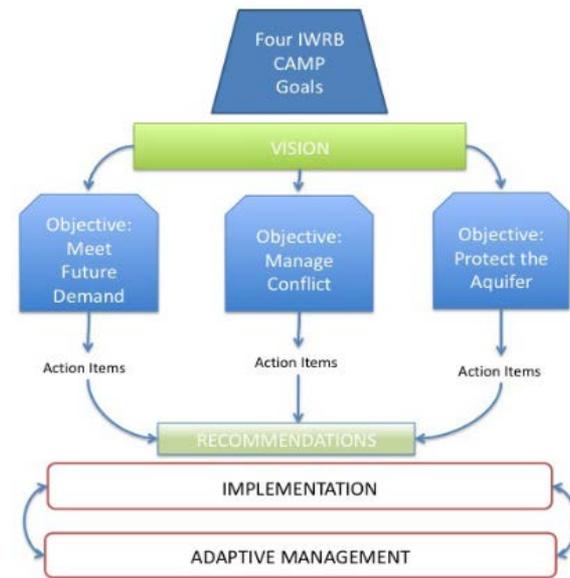
CAMP, Future Water Demand, Next Steps

- Future Demand Study completed in 2010
- Rathdrum Prairie Comprehensive Aquifer Management Plan adopted July 2011
- What next steps were identified in the Rathdrum Prairie Comprehensive Aquifer Management Plan?
- Let's have a look...



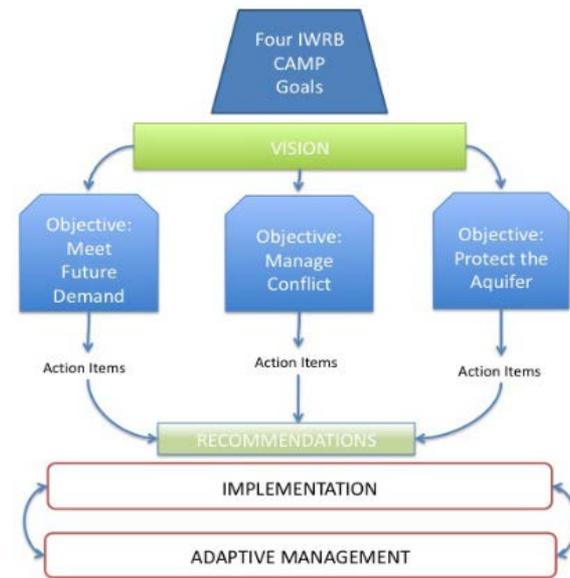
CAMP: Objective #1 Meet Future Demand for Water

- Action Item #2
 - Establish municipal water rights to ensure that they are available for future needs
- Municipal Water Rights – RAFN?
 - RAFN application components
 - Basic water-right elements
 - Planning area
 - Planning horizon
 - Population projections
 - Water-demand projections
 - Review of existing water-rights portfolio



CAMP: Objective #1 Meet Future Demand for Water

- Action Item #5
 - Assess the Rathdrum Prairie Aquifer Water Demand Projections on a regular basis
- Compare projections with existing conditions
- Review assumptions
- Update projections
- Are there any missing components?
- Different Approach needed?



Discussion...