



# Assessment of Water Resources that Might Benefit from Augmentation

Development of Preliminary Environmental Information for the Reclaimed Water Comprehensive Plan



**King County**

Department of Natural Resources and Parks  
**Wastewater Treatment Division**



# Outline

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- What this Assessment is About
- Stream Information
- Groundwater Information
- Wetland Information
- Next Steps



# What This Assessment is About





# Are There Places that Would Benefit from More Water?

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- Assess flows and water quality in local streams
  - Have low summer flows decreased over the years?
  - Which streams have elevated summer temperatures?
- Assess groundwater conditions
  - Have areas previously been identified where groundwater levels have dropped
  - Are there areas where water can be infiltrated to groundwater?
- Assess wetlands
  - Which wetlands would likely benefit from additional water?



# Approach Overview

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- No new field studies or research
- Use existing data
- Maximize use of existing reports and studies
- Be clear about what we do and do not know
- This and other environmental information will be used by project team ***in combination with engineering, financial, and economic information***



# Stream Information





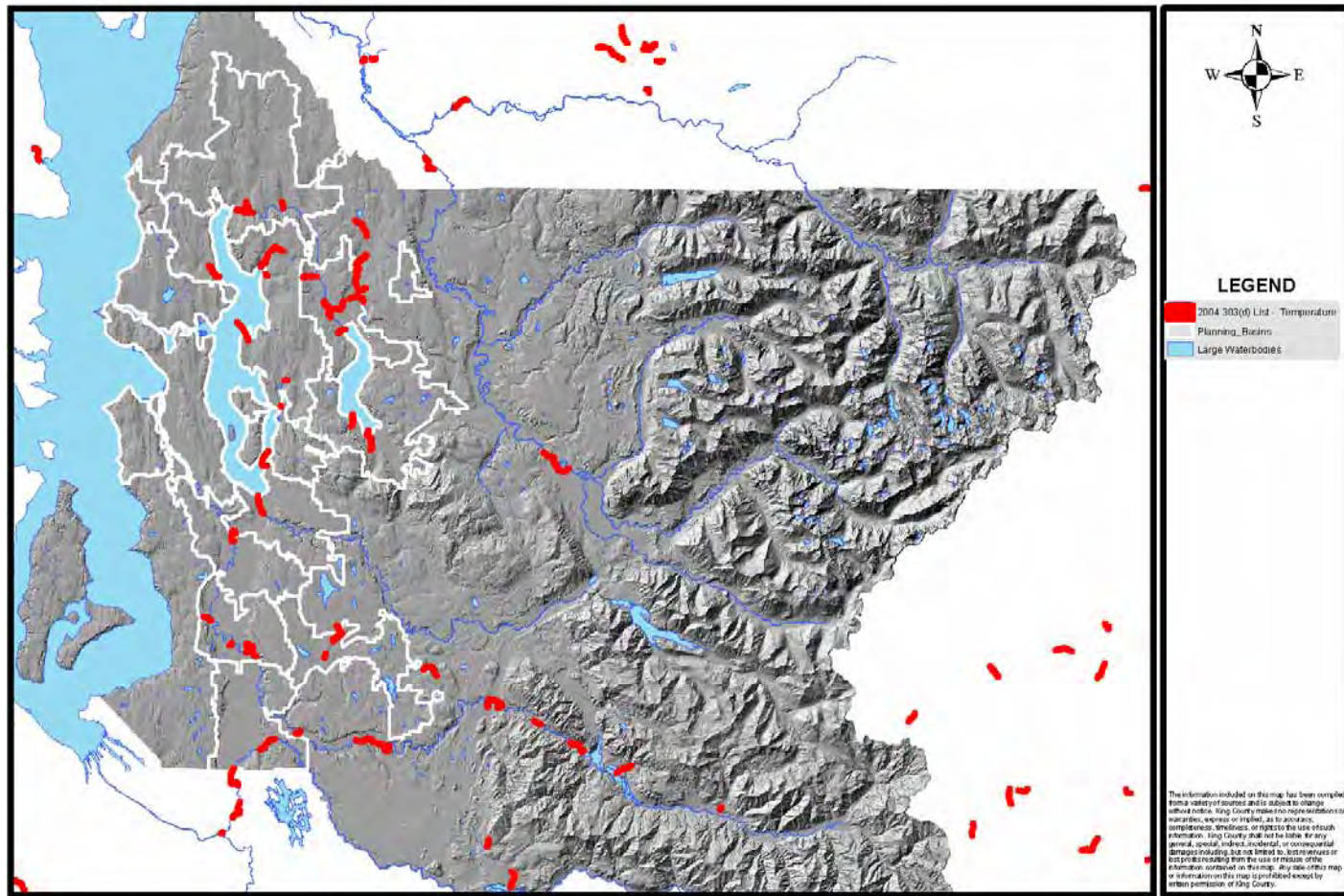
# Approach for Streams

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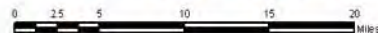
- Review and summarize previous studies of flow impairment and temperature in local streams and rivers
  - 303d list
  - Tributary Streamflow report and various other technical reports and studies
- Compile and summarize existing plans and rules relevant to stream flow
  - Habitat Conservation Plans (HCPs)
  - Instream Flow Rules
- Analyze existing flow and temperature data to confirm previous studies and possibly identify other affected streams



# State 2004 303(d) List of Streams Impaired by Temperature

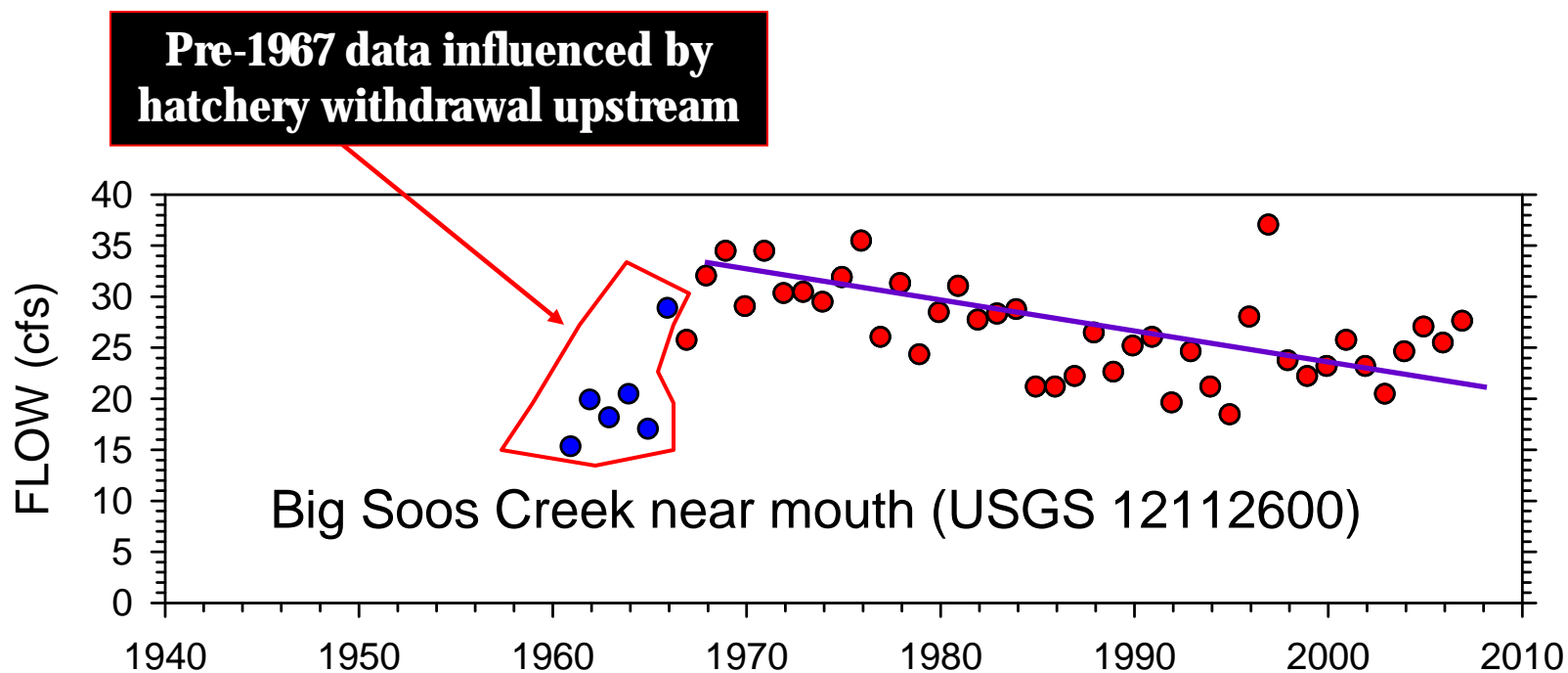


Assessment of Stream Flows for Possible Benefits of Flow Augmentation in WRIAs 8 and 9 and Parts of WRIAs 7 and 10.



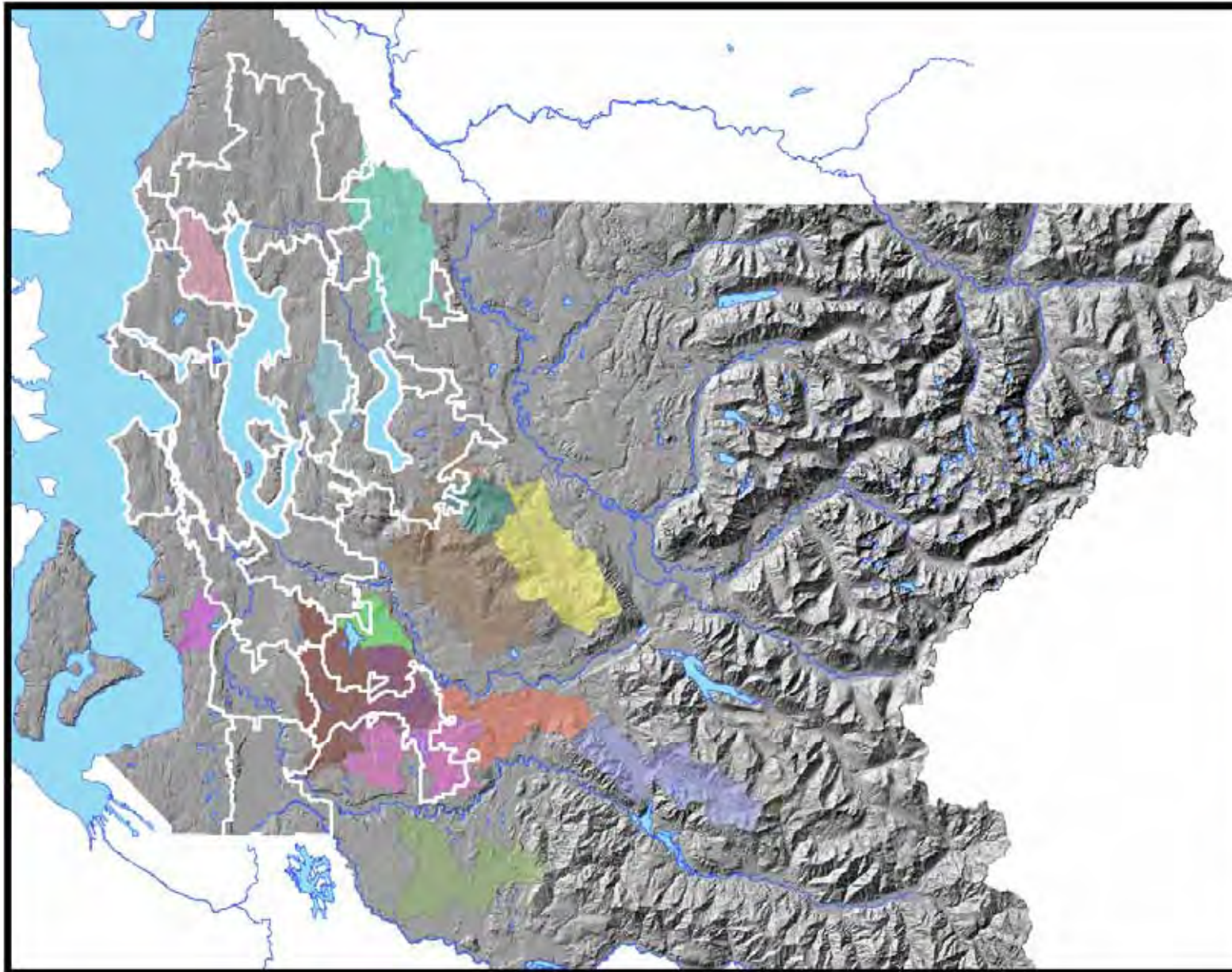


# Confirmed previously identified low flow trends



# Basins that Might Benefit from Additional Water

#	Stream basin	Water Temperature	Downward Trend in Summer Low Flow	Tributary Streamflow Technical Committee
1	Bear Creek	x		x
2	Big Soos Creek	x	x	x
3	Covington Creek	x		x
4	Des Moines Creek	x	x	
5	East Fork Issaquah			x
6	Issaquah Creek	x	x	x
7	Jenkins Creek	x		x
8	Kelsey Creek	x	x	
9	Newaukum Creek	x	x	x
10	North Fork Green River			x
11	Peterson Creek	x	x	
12	Raging River	x	x	
13	Rock Creek	x	x	x
14	Thornton Creek	x	x	

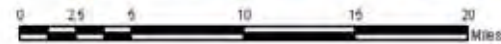


**LEGEND**

- Planning Basins
- Initial Screening Basins**
- Subbasin**
- Bear Creek
- Bear Creek (Green)
- Covington Creek
- Des Moines Creek
- East Fork Issaquah Creek
- Issaquah Creek
- Jenkins Creek
- Kelsey Creek
- Newaukum Creek
- North Fork Green River
- North Fork Snoqualmie River
- Peterson Creek
- Raging River
- Rock Creek (Lower Cedar)
- Soos Creek
- South Fork Snoqualmie River
- Thornton Creek
- Large Waterbodies

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**Assessment of Stream Flows for Possible Benefits of Flow Augmentation in WRIAs 8 and 9 and Parts of WRIAs 7 and 10.**





# Streams Uncertainties and Conclusions

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- Some uncertainties remain
  - Not all basins have long term gauge records
  - Many trends are not statistically significant
- However, data are sufficient to conclude
  - Previously identified trends in low summer flows have been confirmed
  - There are at least 14 basins where additional flows would likely improve environmental conditions



# Groundwater Information

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# Goals for Groundwater Assessment

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- Identify aquifers that
  - will potentially benefit from additional water
  - discharge to surface water features that will potentially benefit from receiving reclaimed water
- Identify areas that have high infiltration potential based on geologic conditions and land use

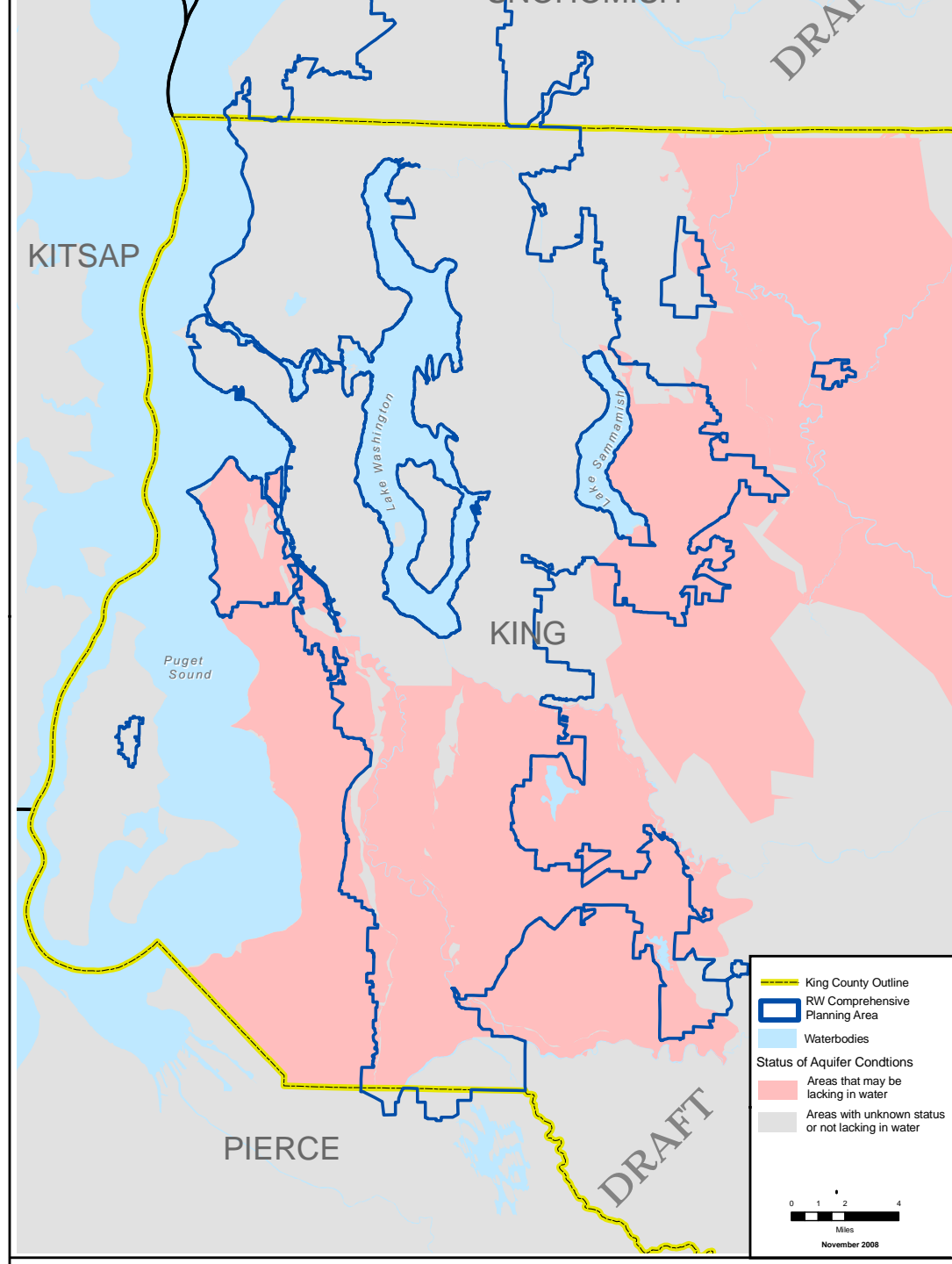


# Approach for Groundwater

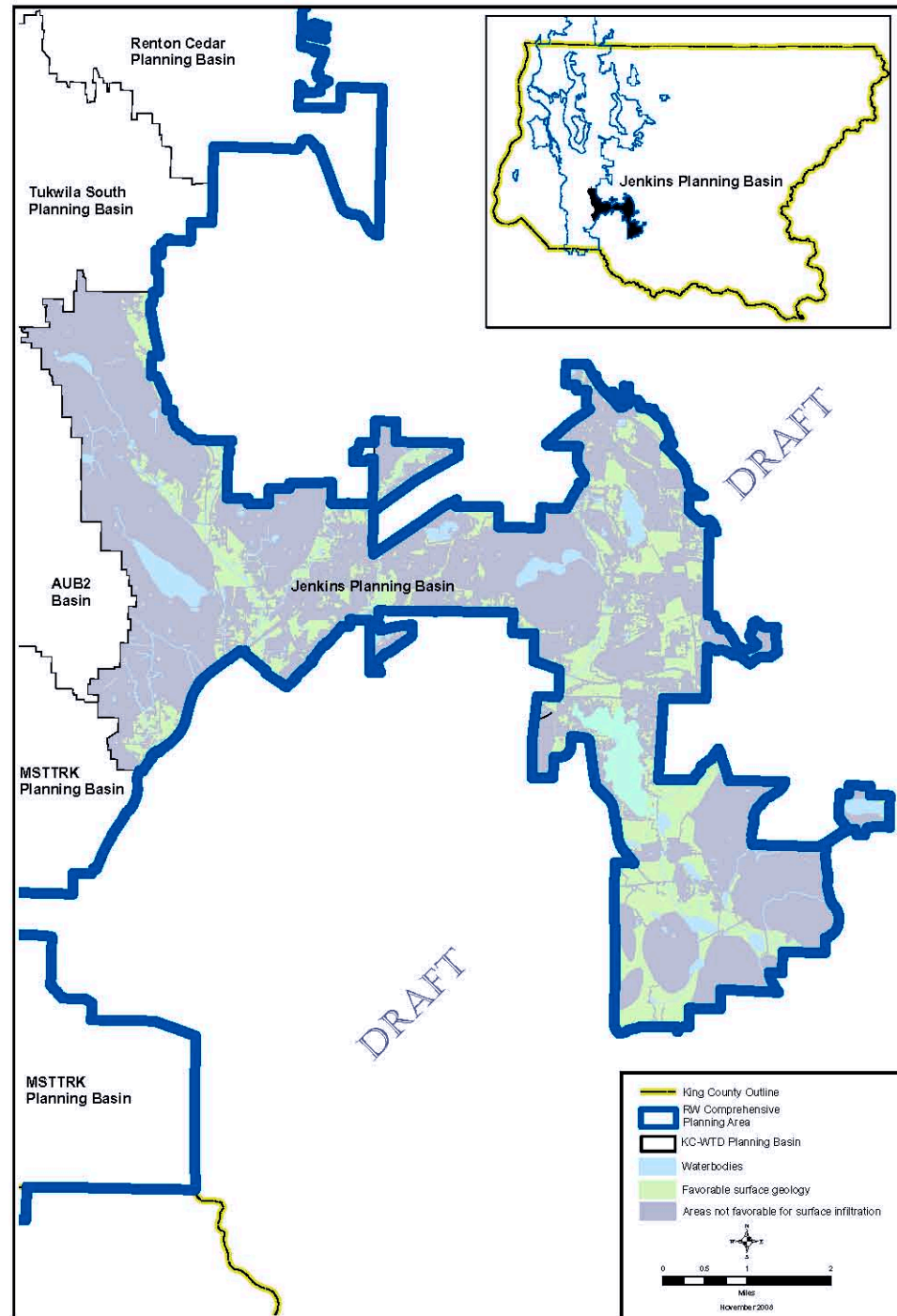
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- Review readily available documents
- Use readily available GIS data
  - Hydrogeologic Data
  - Soils Data
  - Water Level Data
  - Well Data
- Identify areas where there is higher potential for successful infiltration to groundwater
- Identify gaps in data

# Aquifers that may be Lacking Water



# Example of Identification of Possible Groundwater Infiltration Areas: Jenkins Creek Planning Basin





# Groundwater Uncertainties and Conclusions

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- Some uncertainties remain
  - Lack of groundwater data in many places makes thorough evaluation impossible
  - Data comparability and quality issues (soil, geology, well location, etc) pose challenges
- However, data are sufficient to conclude
  - There are many places where groundwater issues have been identified
  - There are many places where it is likely possible to infiltrate waters to the groundwater system



# Wetlands Information

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# Goal for Wetlands

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- Determine population of wetlands that have been hydrologically altered and are most likely to benefit from additional water



# Approach for Wetlands

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- Use readily available GIS data
  - King County Wetland Inventory
  - National Wetland Inventory
- Use criteria to select subpopulation of potential wetlands
  - Not a bog or coniferous wetland
  - Total impervious area in basin >10%
  - Forest area in basin <50%



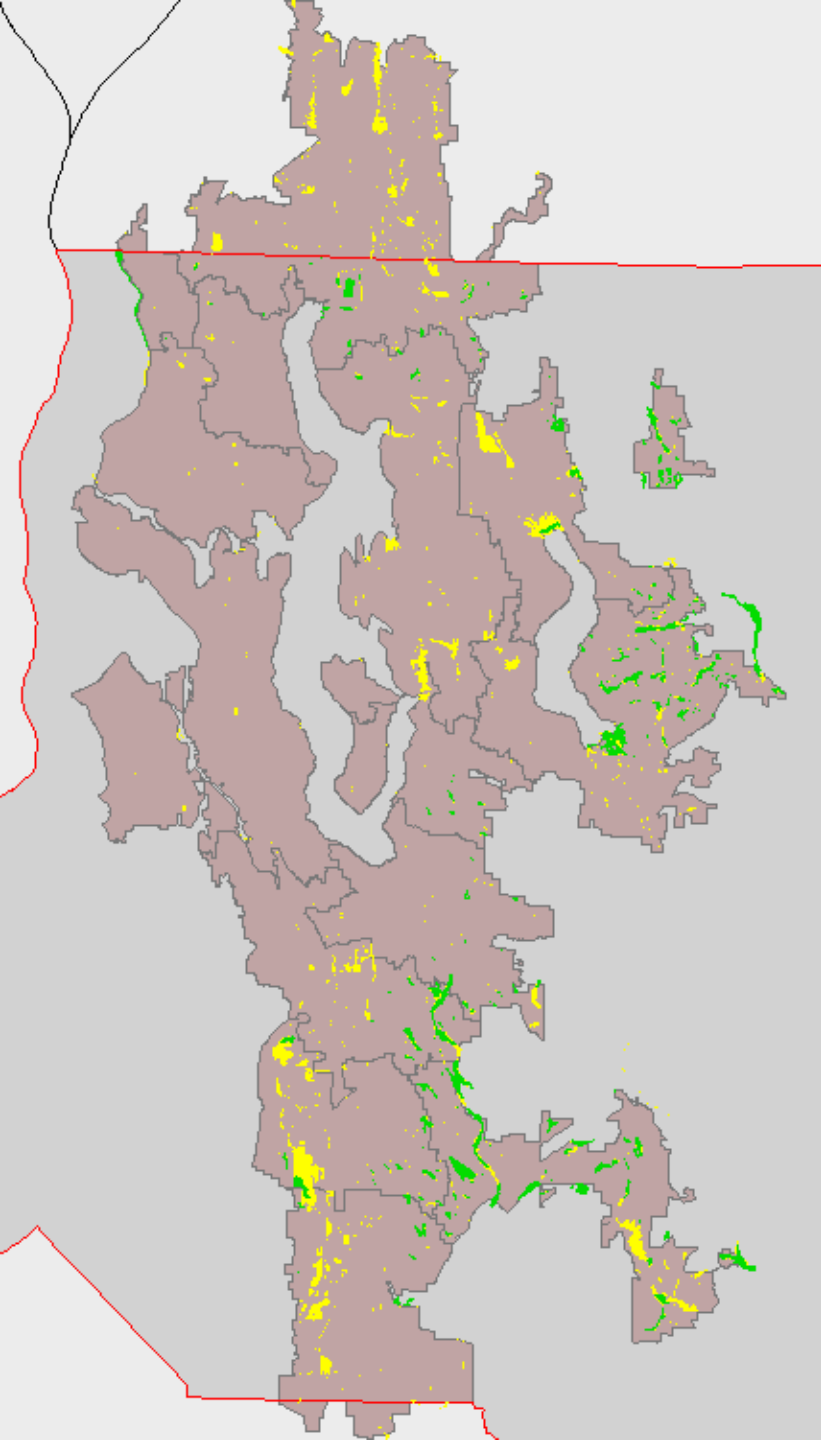
# Summary of Findings

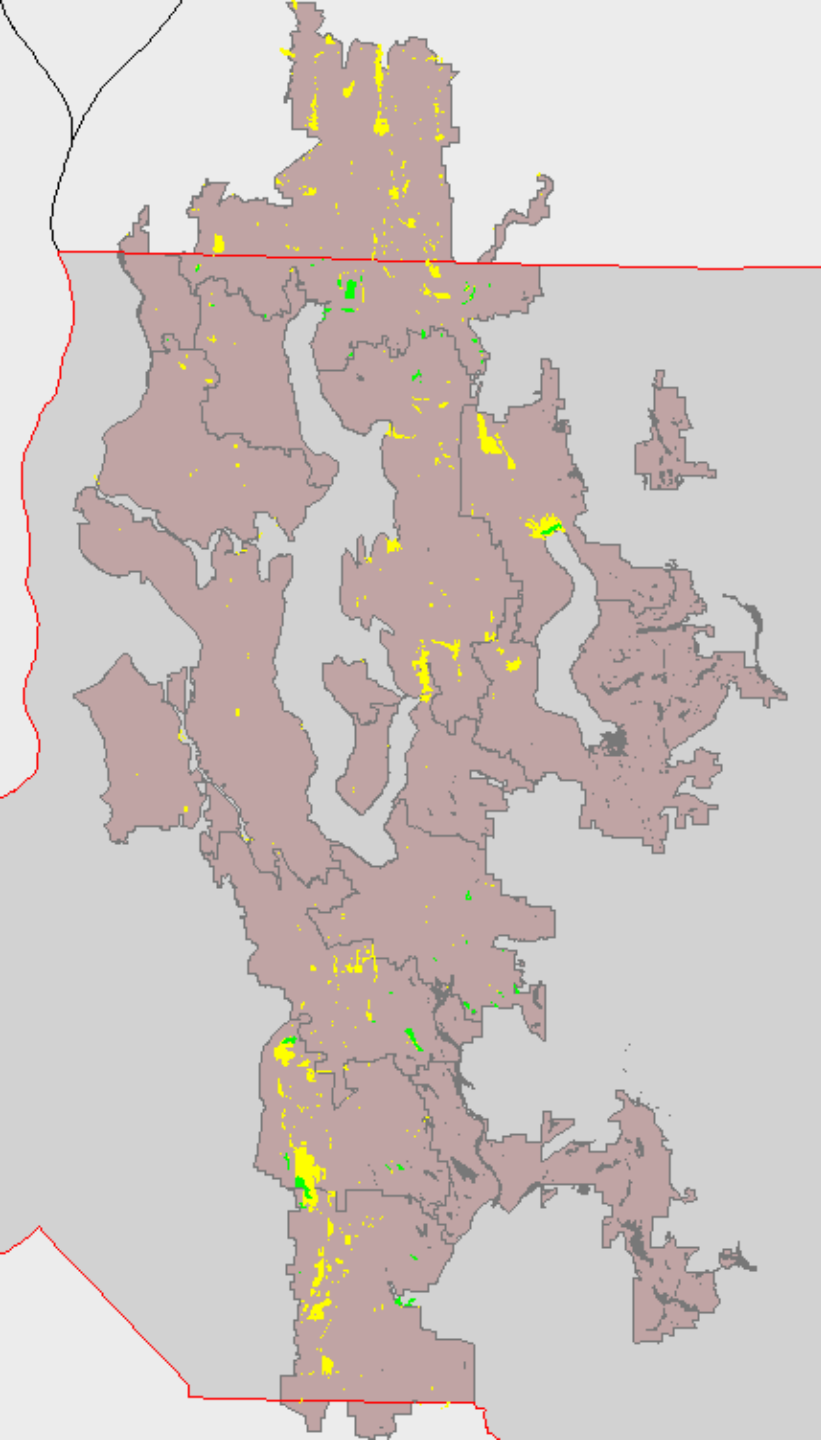
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<b>Filters applied</b>	<b>King County Wetland Inventory</b>	<b>National Wetland Inventory</b>
# wetlands in data set	237	1483
Eliminate bogs and forested wetlands	Bogs (23) & Forested Wetlands (12) → 202	Bogs (16) & Forested Wetlands (9) → 1458
Total impervious area greater than 10%	193	1405
Forested area less than 50%	48	865

# Key Findings

- All Wetlands in dataset





# Key Findings

- ❑ Wetlands that have been hydrologically altered and are likely to benefit from additional water



# Wetlands Uncertainties and Conclusions

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- Some uncertainties exist
  - Wetland inventories are outdated
  - Lack of site-specific information in inventory makes assessment difficult
- However, data are sufficient to conclude
  - That there appear to be plenty of altered wetlands in the planning area that could possibly benefit from additional water



# Next Steps

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- Incorporate comments on draft reports
- Any future assessments to be determined by Reclaimed Water Comprehensive Plan Team depending on project needs
- Possible ideas include
  - Site visits to verify information
  - Calculation of amount of improvement
  - Accounting for climate change

QUESTIONS?