



# Water Management on the Carlin Trend: Mining, Agriculture, and Ecosystem Enhancement

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# Water Management - Mining

Mining on the Carlin Trend began in the mid 1960's

Mine water management became important in the late 1980's with the discovery of deep gold mineralization below the water table

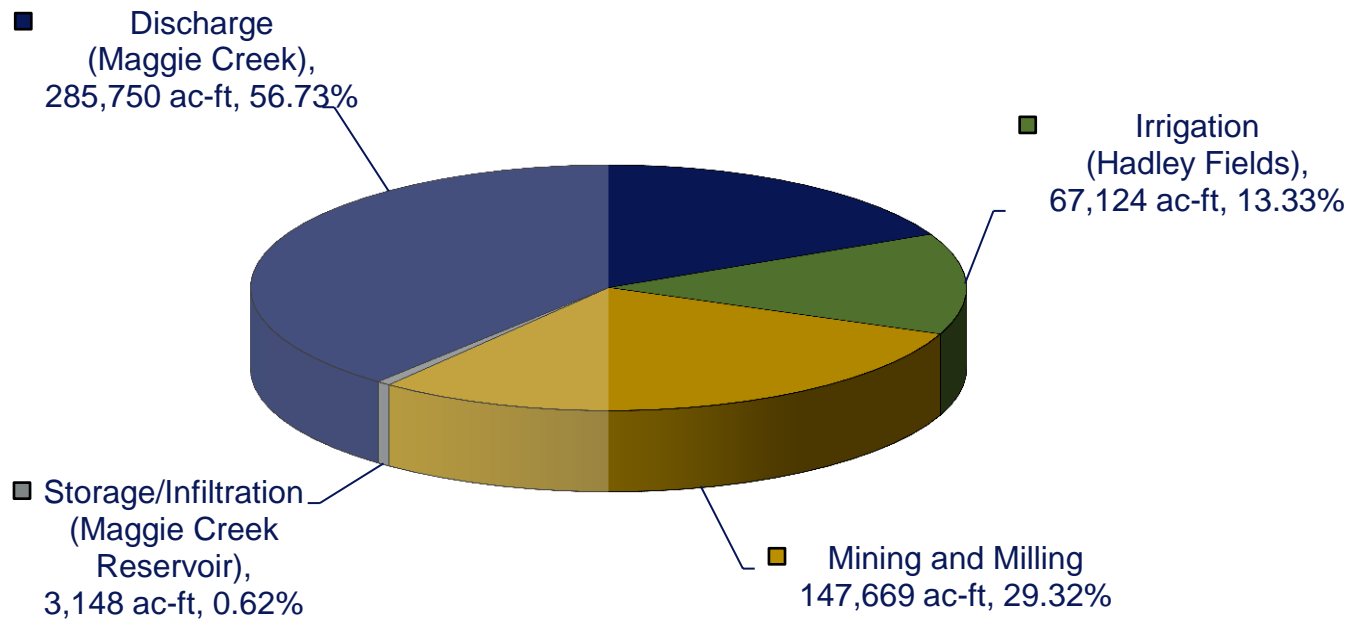
Water Management Agreement between Newmont and Barrick, 1989

Dewatering begins:           **Post/Betze, 1990**  
  **Gold Quarry, 1992**  
  **Leeville, 2003**

Water Distribution: Mining and Milling, Irrigation, Infiltration, Discharge

# Mining

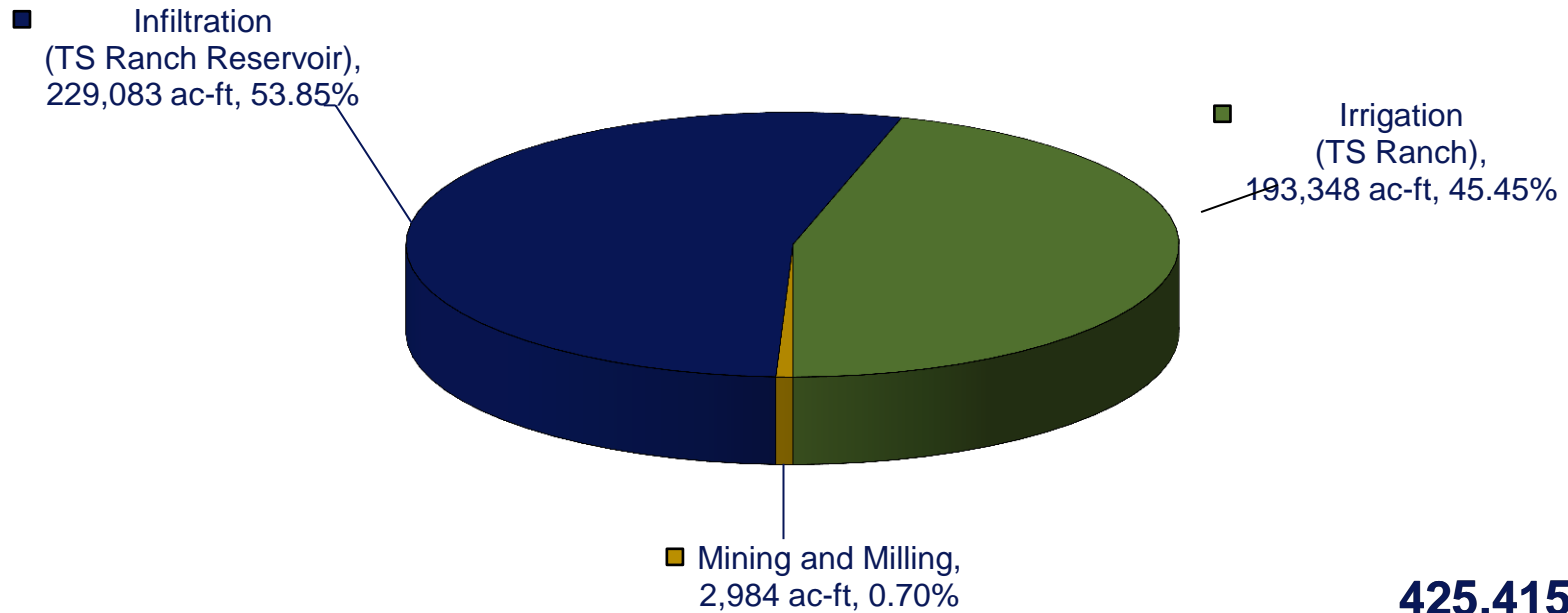
## Gold Quarry Dewatering Distribution May, 1992 Through September, 2013



**503,691**  
**Total Acre Feet**

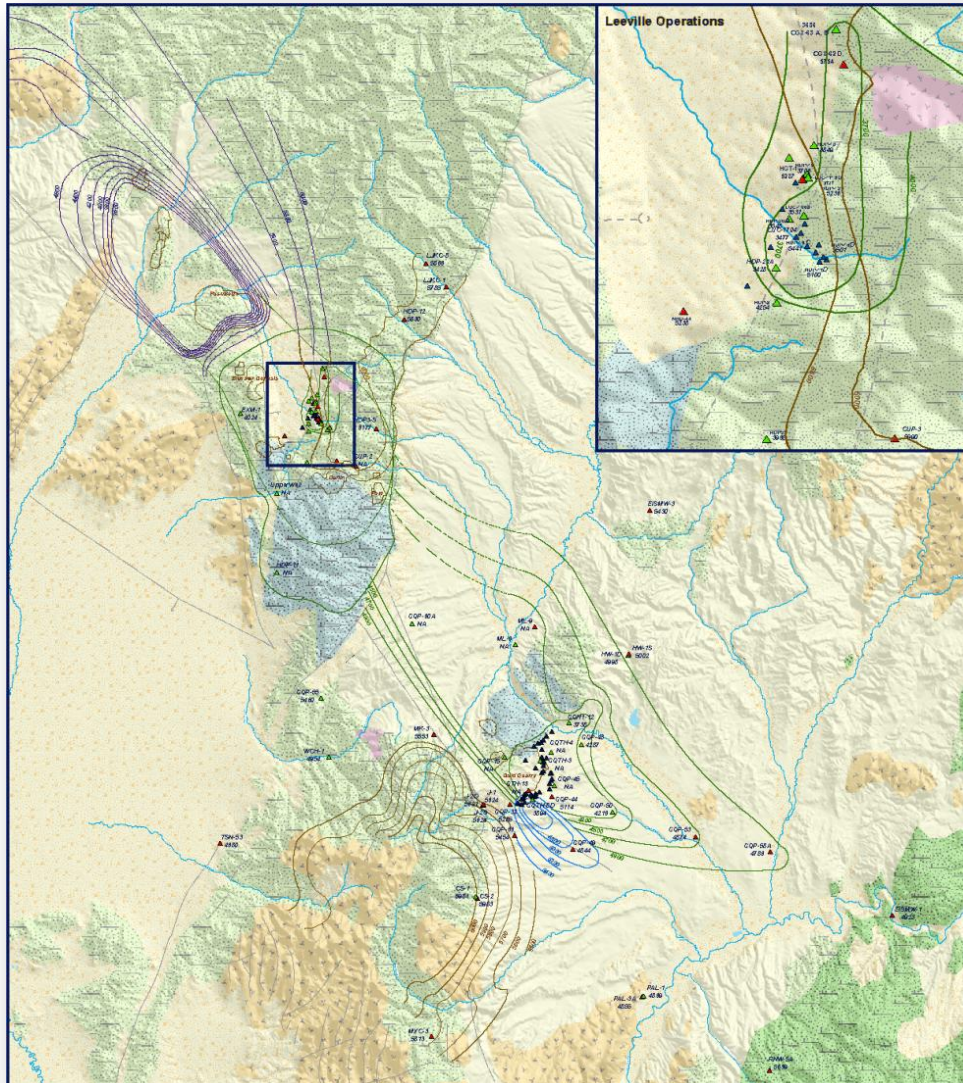
# Mining

## Leeville Dewatering Distribution: August, 2003 Through September, 2013



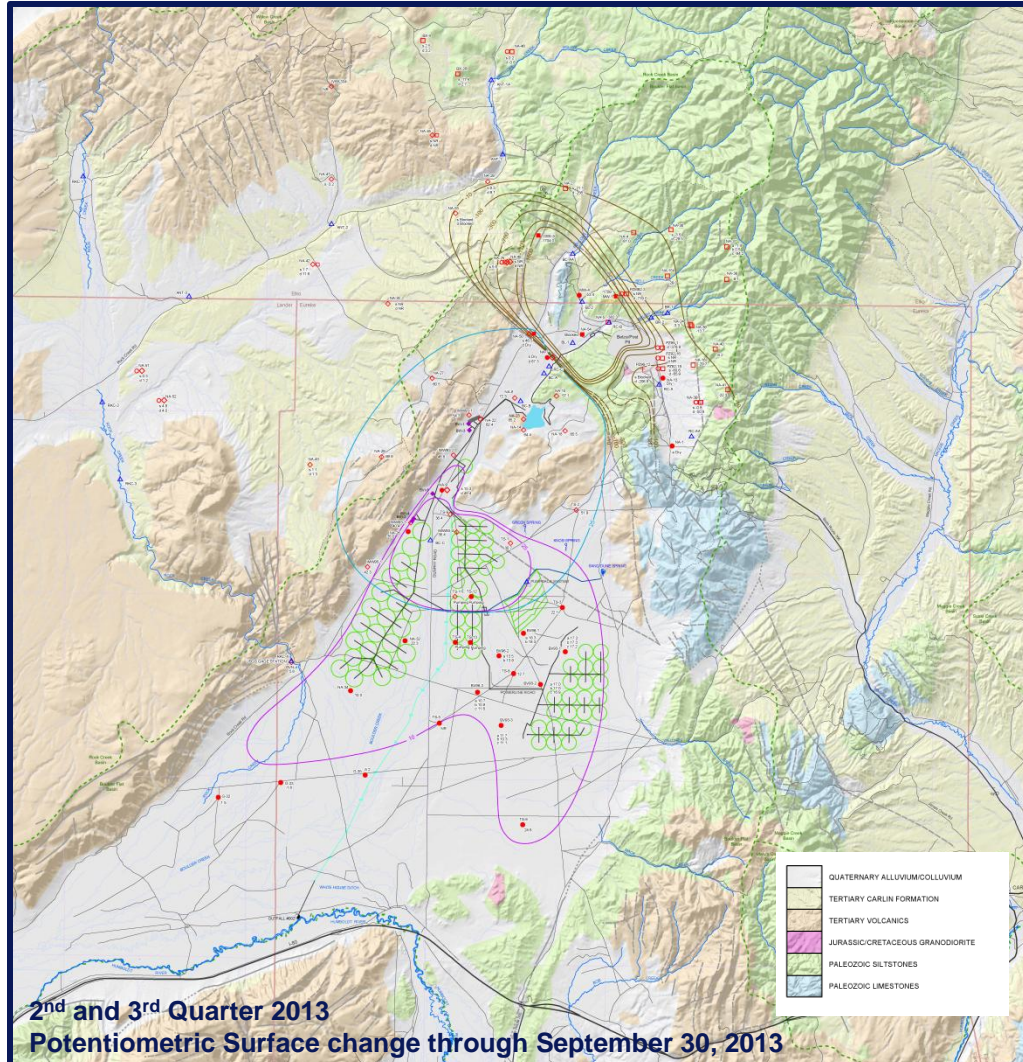
**425,415**  
**Total Acre Feet**

# Maggie Creek Basin Monitoring Plan



	<b>Legend</b> <ul style="list-style-type: none"> <li>— Structurally Isolated Mary's Mtn Formation</li> <li>— Carbonate Contour</li> <li>▲ Carbonate Monitoring Well</li> <li>▲ Carbonate Monitoring Well</li> <li>▲ Devaluing Wells</li> <li>— Geologic Fault</li> </ul>	<ul style="list-style-type: none"> <li>○ Alluvial, Fluvial, Landslide Deposits</li> <li>○ Carlin Formation, Sedimentary &amp; Volcanics; Sedimentary rocks</li> <li>○ Volcanics</li> <li>○ Extrusives</li> <li>○ Overlap Assemblage, Diamond Peak, Chalmers, Web</li> <li>○ Eastern Assemblage, Popovich, Roberts Mountain</li> <li>○ Hanson Creek, Locally includes Eureka Quartzite</li> <li>○ Western Assemblage, Vinal Formation, shale, chert, and Mary's Mountain</li> </ul>		<p><b>NEWMONT</b> NORTH AMERICA</p> <p><b>NEWMONT MINING CORPORATION</b></p> <p><b>Maggie Creek Basin Monitoring Plan</b> Bedrock Groundwater Elevation Jan, 2014</p>

# Boulder Valley Monitoring Plan



- MONITORING WELL QUATERNARY ALLUVIUM/COLLUVIUM
- MONITORING WELL TERTIARY CARLIN FORMATION
- ◇ MONITORING WELL TERTIARY VOLCANICS
- + MONITORING WELL JURASSIC/CRETACEOUS GRANDIORITE
- MONITORING WELL PALEOZOIC SILTSTONES
- MONITORING WELL PALEOZOIC LIMESTONES
- ▲ SURFACE MONITORING STATION
- ◆ BOULDER VALLEY INJECTION WELLS
- s & d SHALLOW AND DEEP COMPLETIONS
- a, b & c DIFFERENT COMPLETION DEPTHS, a=SHALLOW, b=INTERMEDIATE, c=DEEP
- 25 WATER LEVEL CHANGE IN TERTIARY VOLCANICS, POSITIVE NUMBER INDICATES INCREASE
- 10 WATER LEVEL CHANGE IN QUATERNARY ALLUVIUM/COLLUVIUM, POSITIVE NUMBER INDICATES INCREASE
- 300 WATER LEVEL CHANGE IN UPPERMOST BEDROCK DUE TO PUMPING, NEGATIVE NUMBER INDICATES DECREASE
- NR NO READING
- LOCATION OF OUTFALL #002, PERMIT # NV0022675
- ESTIMATED ZONE OF SURFACE WATER AT END OF CURRENT PERIOD
- FAULT LINE
- HYDROLOGIC AREA BOUNDARY



Revision: 1/1/14  
Nevada State Plane 1983 East

# The TS Ranch....Agriculture and Ecological Enhancement



# Agriculture

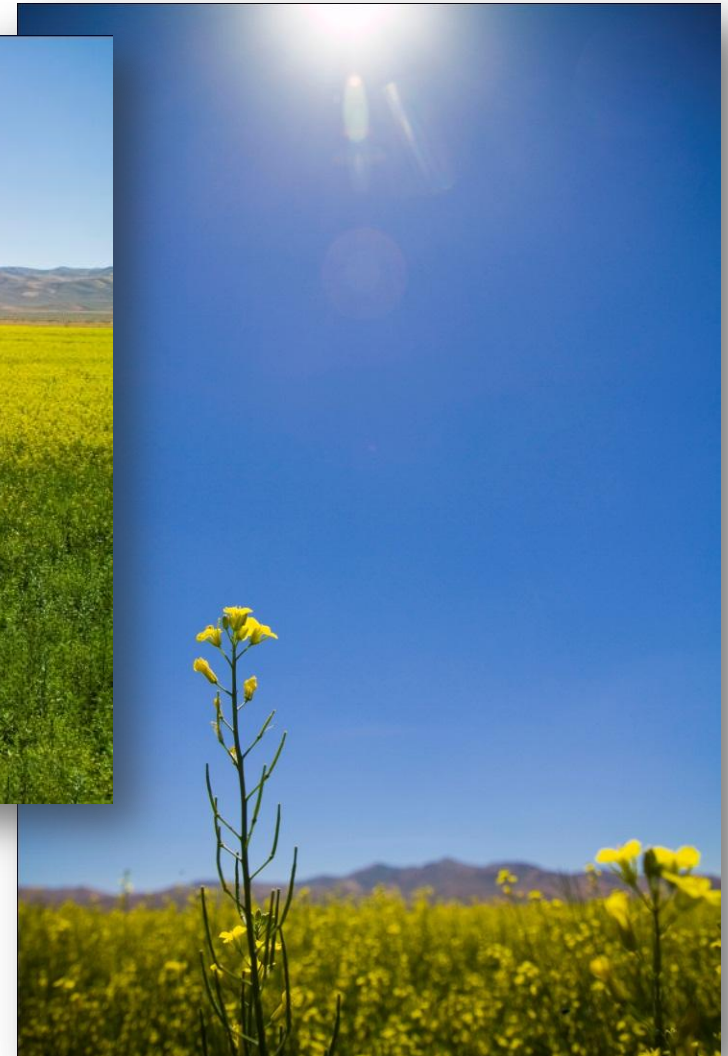




# Irrigation Pivot, Alfalfa, and Antelope



# Alternative Energy – Canola to Bio-diesel



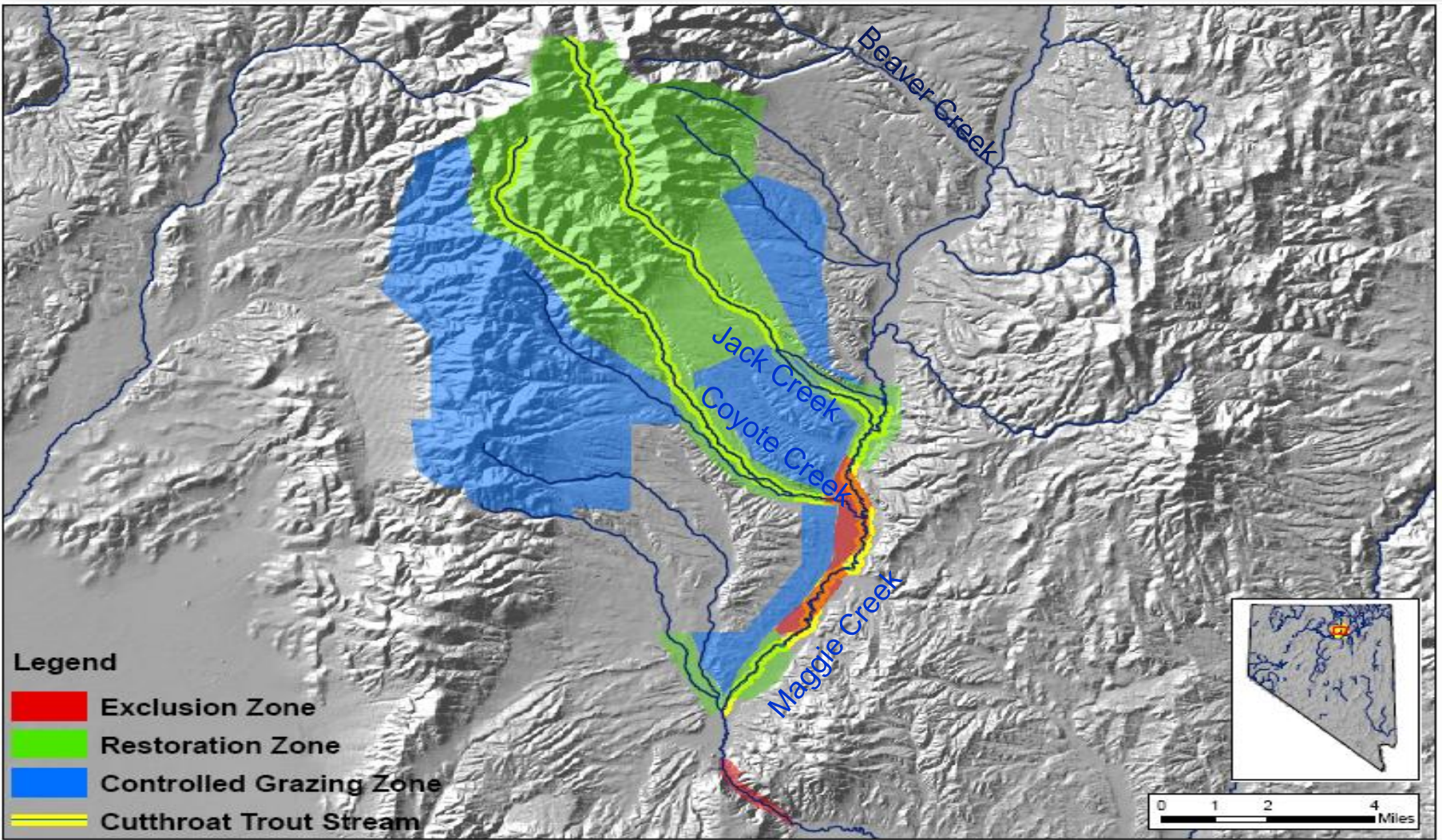
# Cattle Production



# Cattle and Electrical Power



# Ecological Enhancement Maggie Creek Watershed Restoration Plan



# BLM on-the-ground monitoring every 5 years

- Increased sinuosity
- Increased riparian vegetation
- Development of quality pools
- Improved channel substrates
- Narrowed & deepened stream channel



# Maggie Creek Watershed Restoration Plan



# One other very important partner...





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**Thank You For Your  
Attention**



**Maggie Creek  
August 2011**