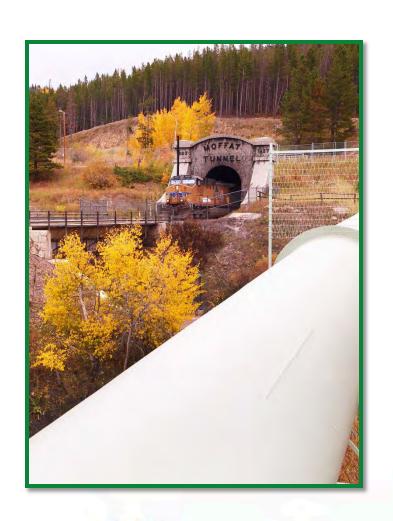




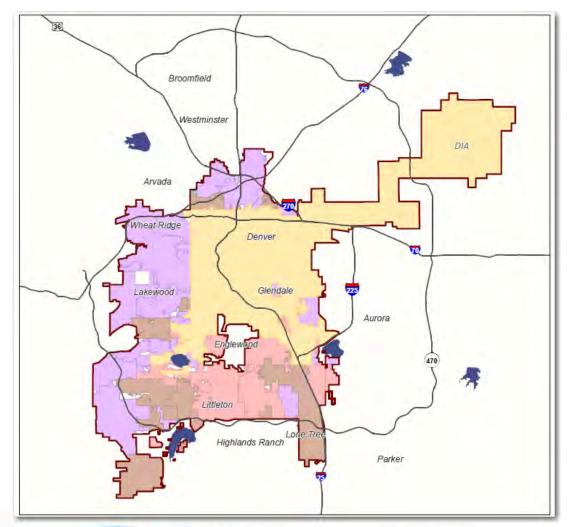
### The Denver Water System

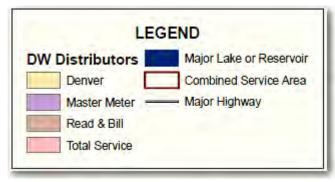
- Established in 1918
- Unique structure
- Serves 1.3 million people — 25% of Colorado's population
- System footprint -4,000 square miles (2.5 million acres)
- 19 raw water reservoirs





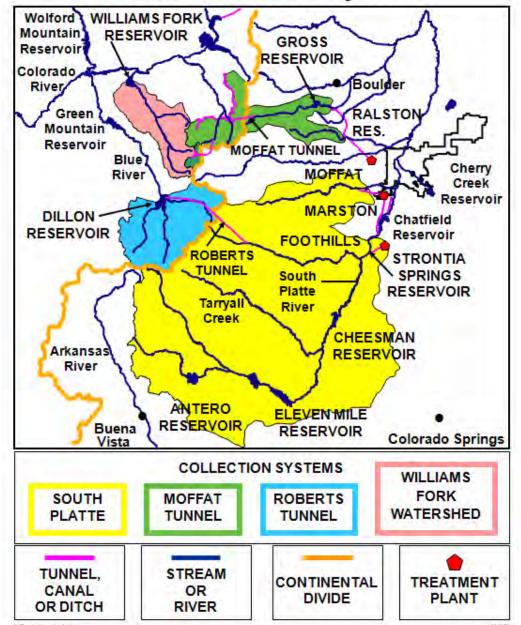
#### **Denver Water's Service Area**



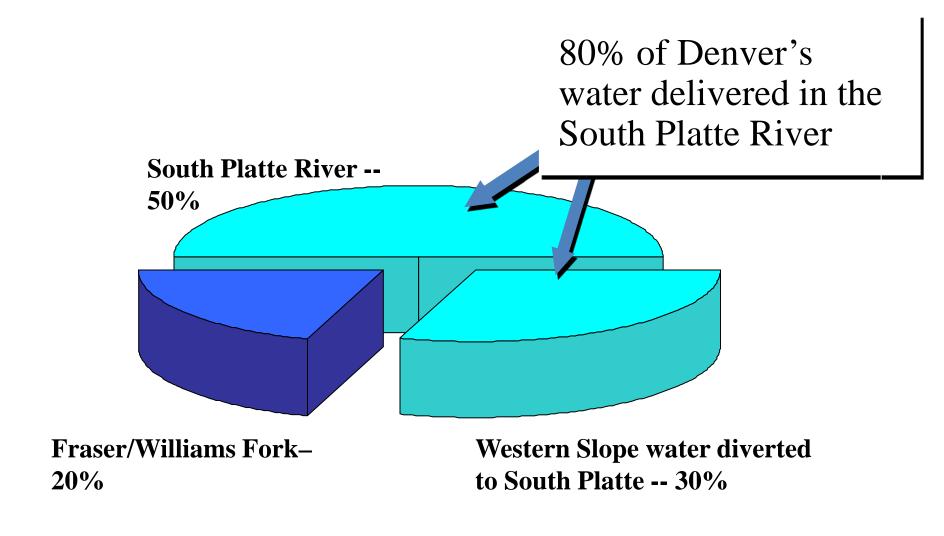




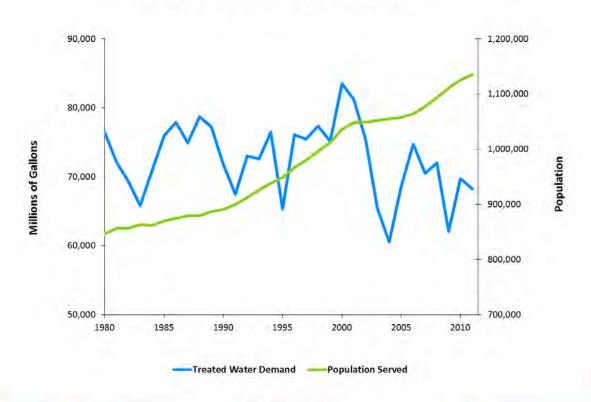
# Denver Board of Water Commissioners Water Collection System



## **Existing Denver Water Supply**

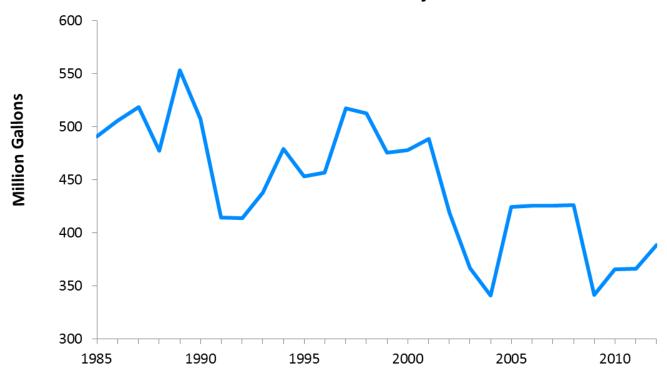


#### **Treated Water Demand and Population**





#### **Maximum Day Use**





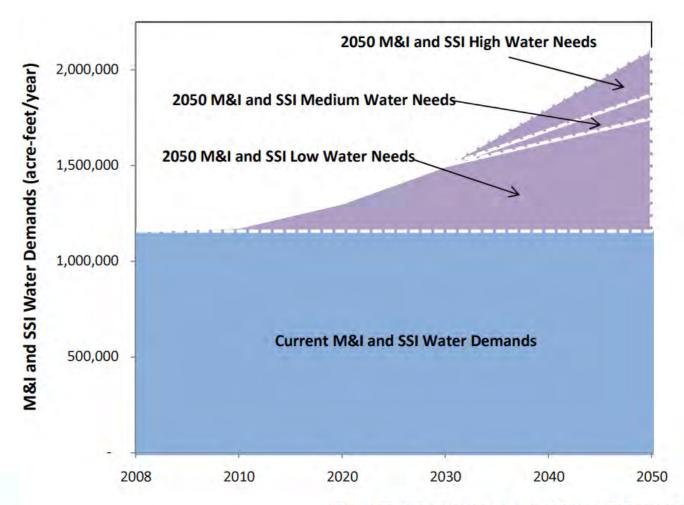


Figure ES-13 Existing and Future M&I and SSI Demands



### "All of the Above" Strategy

- Plans for meeting future growth:
  - Conservation
  - Recycled water
  - Ag sharing
  - System enhancements
  - WISE
  - Gross Reservoir expansion





### **Issues Facing Denver's Water Supply**



- Climate Change
- Drought
- Catastrophic Wildfires
- Terrorism
- Regulatory Requirements
- Colorado River Compact Call
- Growth



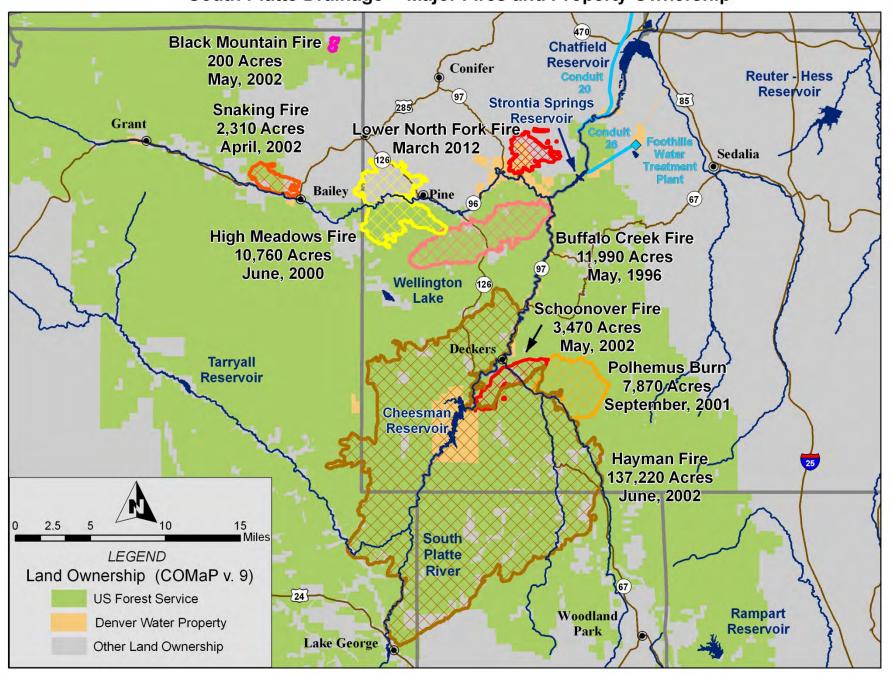


### **Catastrophic Fires**

- 1996 Buffalo Creek (11,900 acres)
- 2002 Hayman (138,000 acres)
- 2012 Lower North Fork (4,140 acres)
- More than 1 million cubic yards of sediment
- DW expenditures of nearly \$30 million prior to USFS partnership

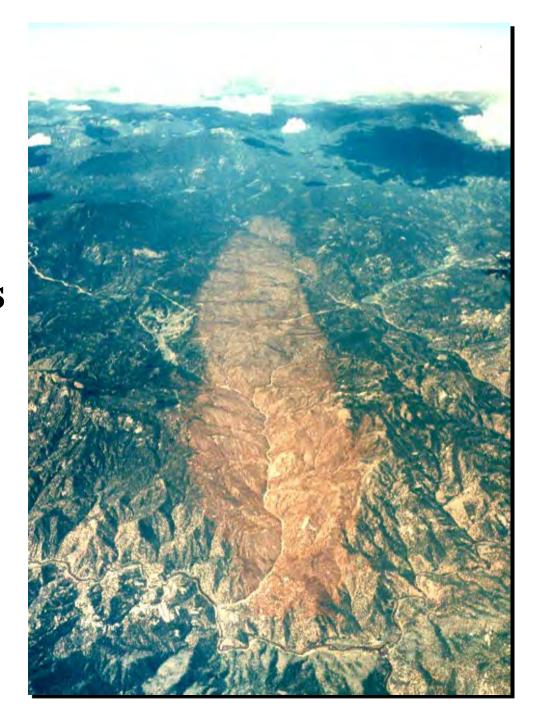


#### South Platte Drainage -- Major Fires and Property Ownership



**Buffalo Creek Fire** May 18, 1996 11 miles in  $4\frac{1}{2}$  hours 11, 900 acres burned Followed by:

Rain events –
Severe Erosion and
Flooding

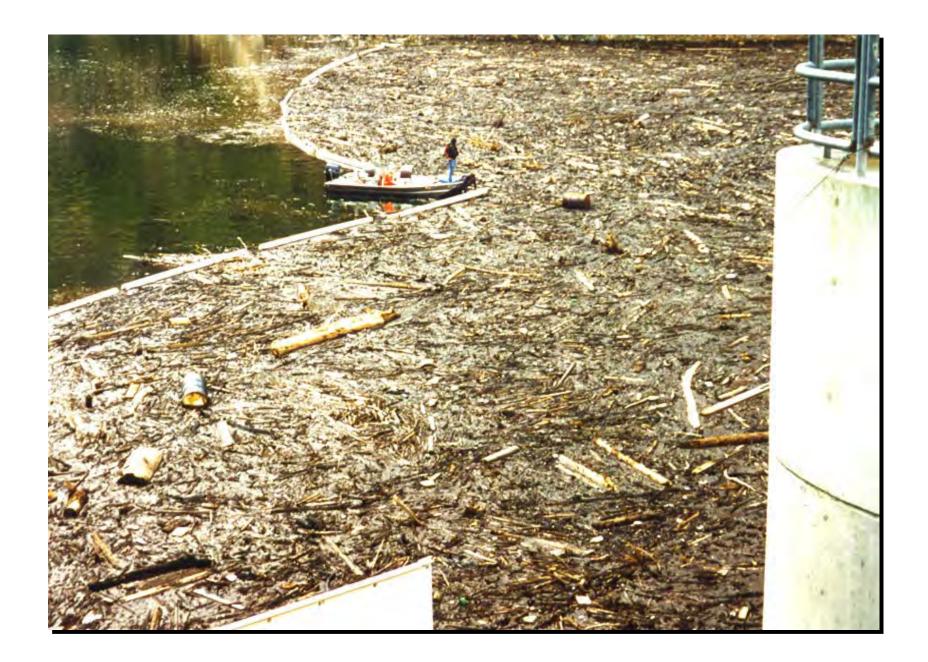




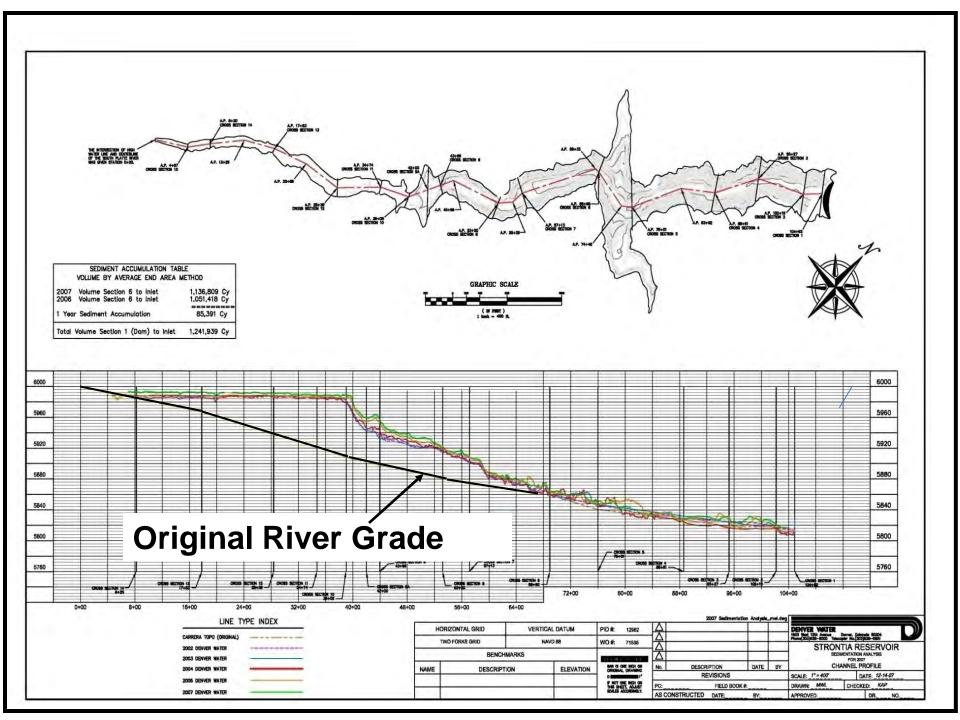




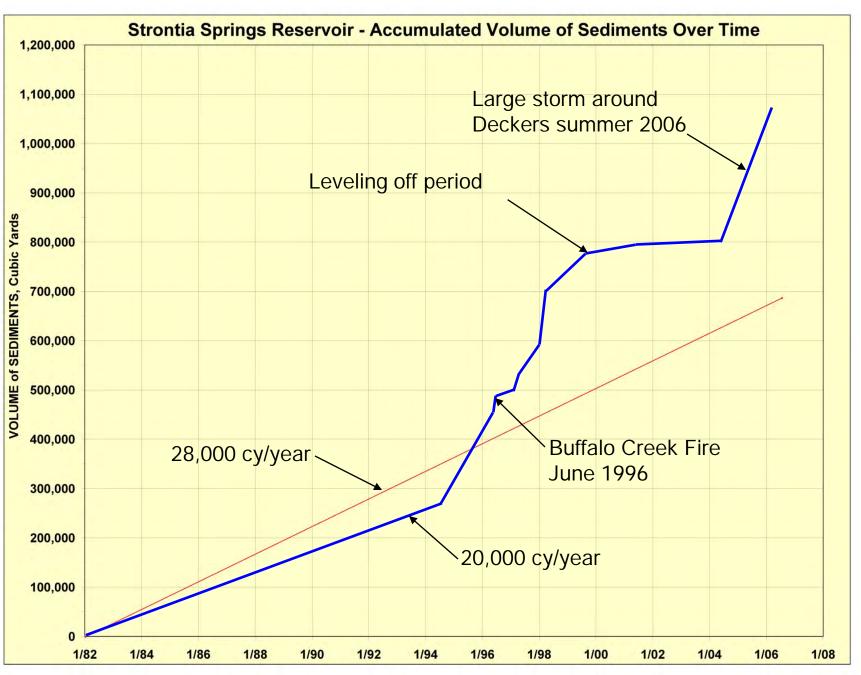


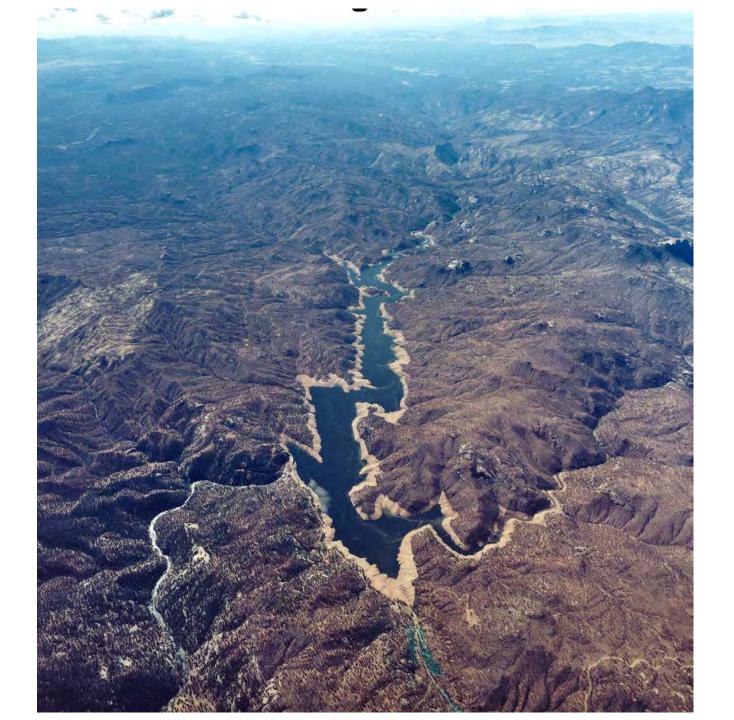






#### **Strontia Springs Reservoir Sedimentation**

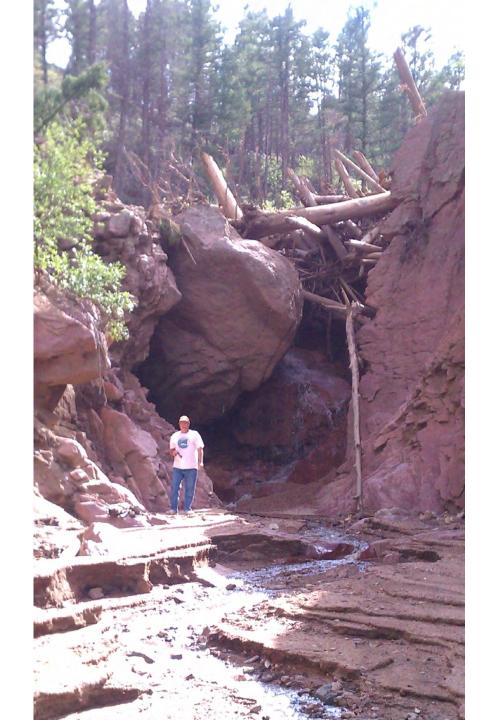


















#### Strontia Reservoir Sediment Removal

- Dredging Alternative Selected in 2009
- 5 Firms Prequalified
- 1 Bid Received in February 2010
- Sevenson Environmental Services Bid Found Responsive and Awarded in April 2010
- Original Contract Value \$30,046,500
- Contract Dredging Quantity 625,000 cubic yards (\$48.07/cy)
- Long Lead Equipment Ordered and Mobilization Began in July 2010



## **Dredging Operations**





## **Dredging Project Status**

- 228,000 cy Removed by Nov. 2011
- Contractor Demobilized by June 2012
- 10 Years of Reservoir Service Restored
- Manganese Levels Reduced in Raw Water



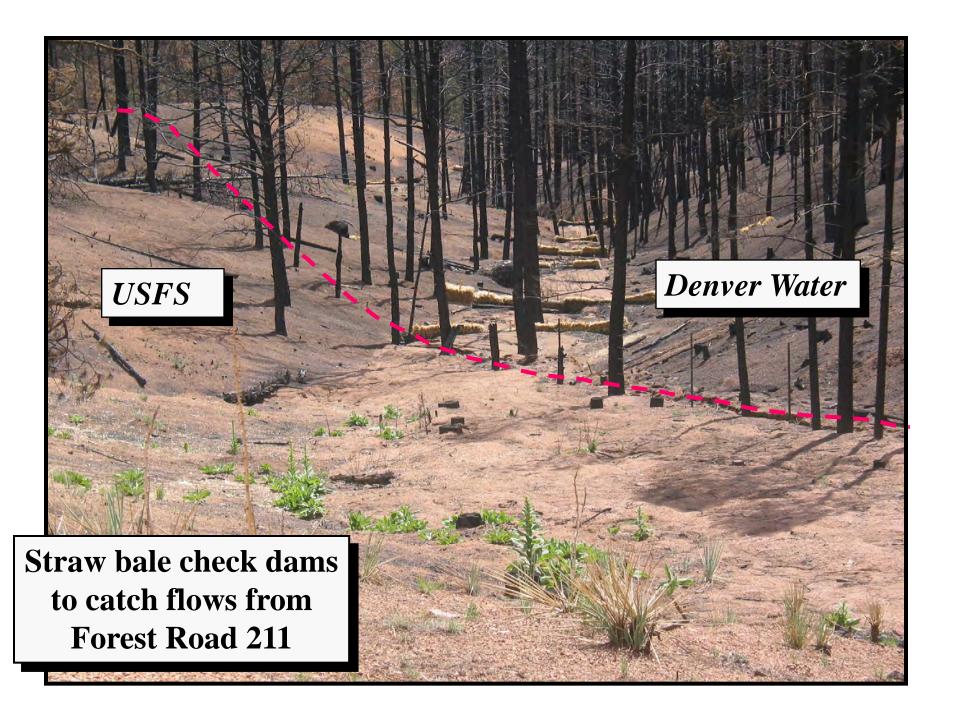
#### **Treatments**

- Straw bales and log sediment dams
- Tree contour and directional felling
- Hydro-seeding and hydro-mulching
- Aerial polymer application
- Hydro-ax
- Salvage
- Rock sediment dams

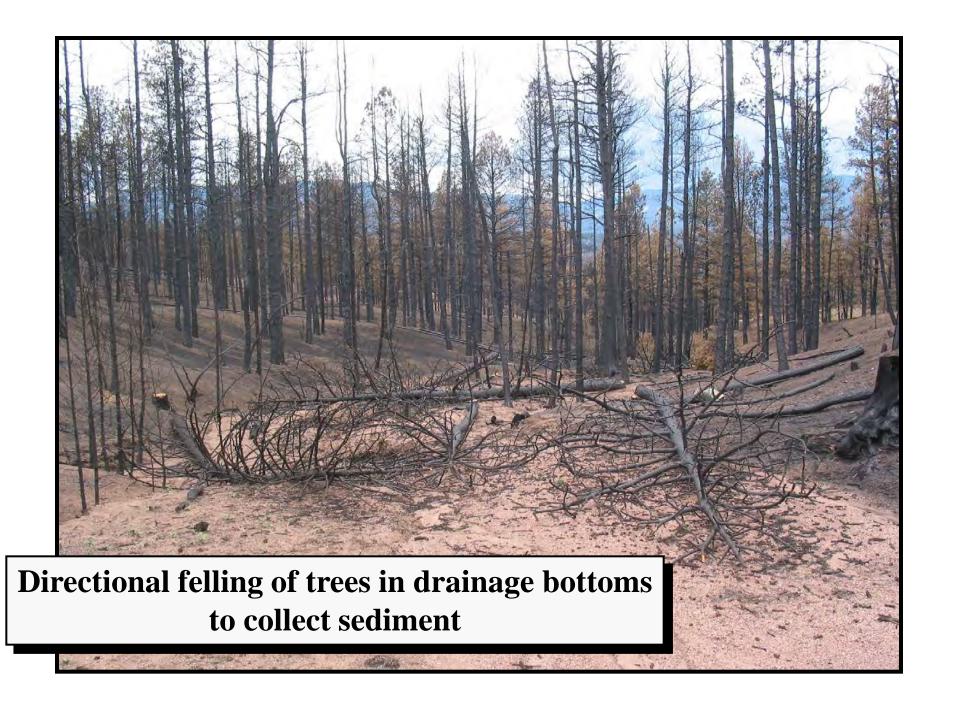


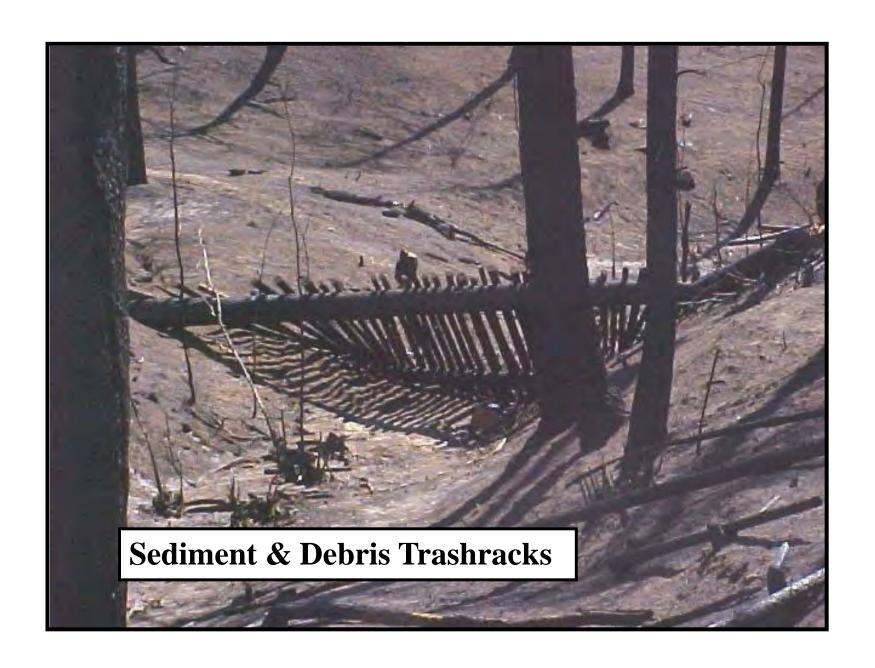
## 30,000 straw bales















Swayback/Jenny Gulch





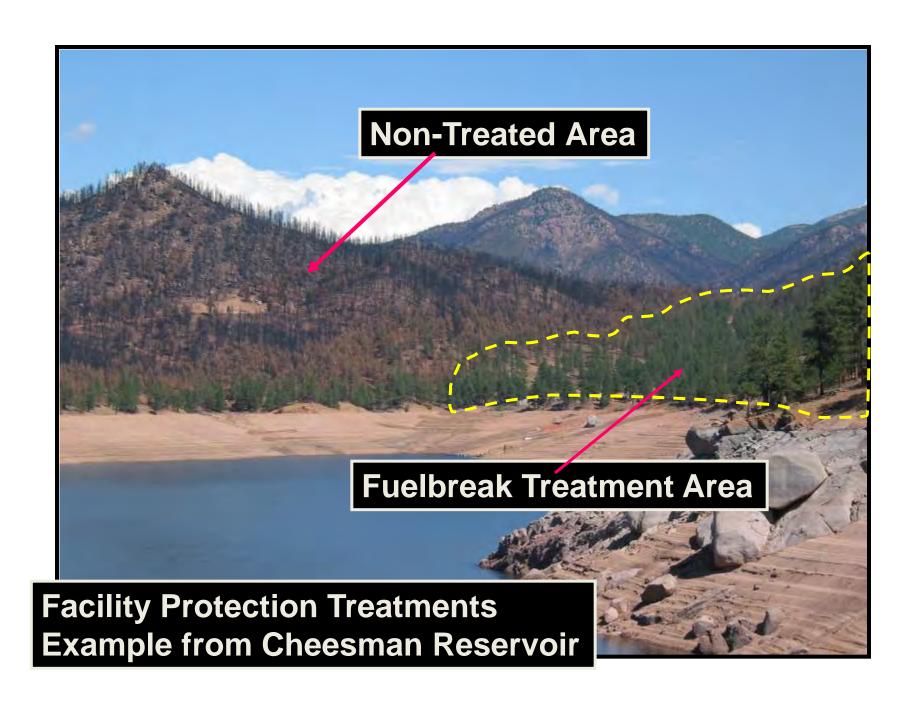


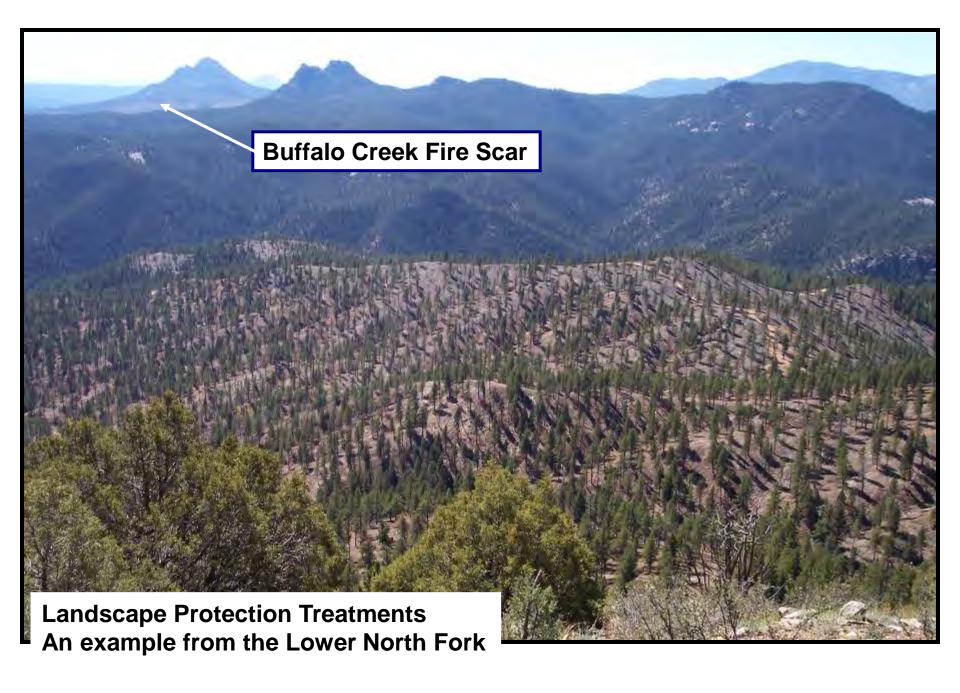


Cheesman Reservoir 1900

Cheesman Reservoir 2002



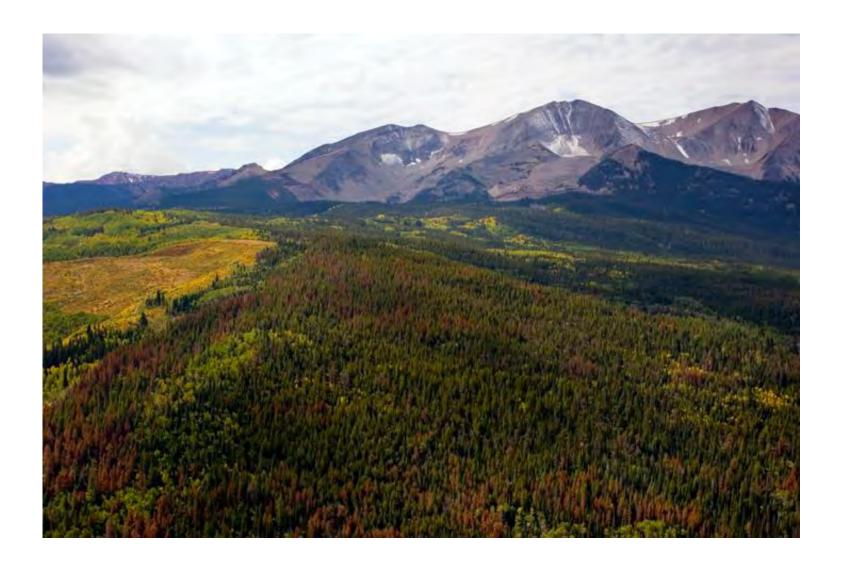












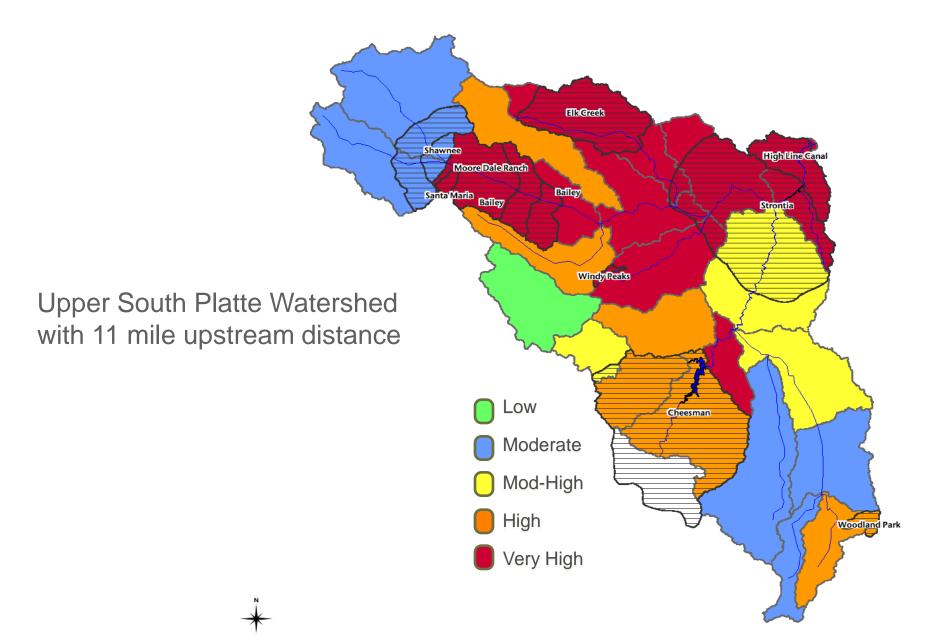


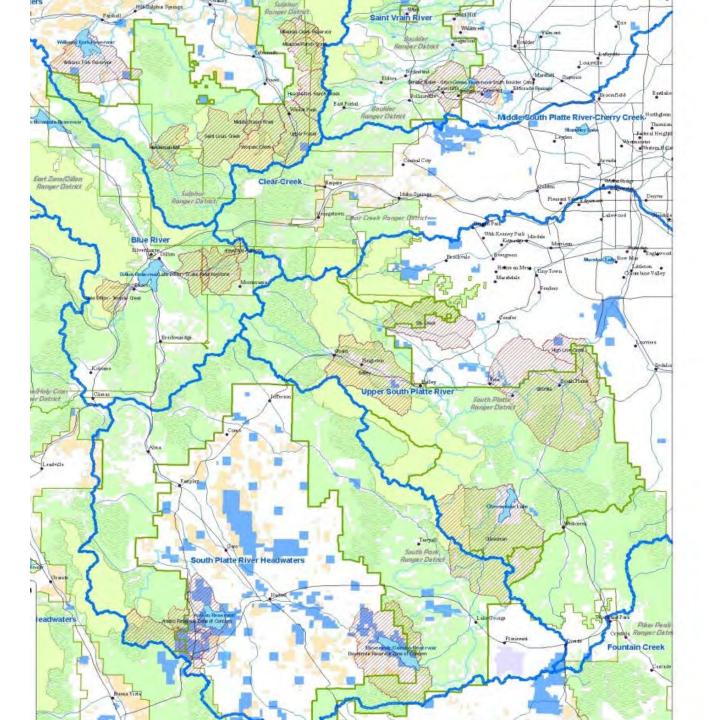
#### **Denver Water/USFS Partnership**

- Agreement executed in 2010
- DW reimburses USFS \$16.5 million over 5 years
- USFS to match with \$16.5 million of work in DW priority areas
- Goal to address over 40,000 acres in the S. Platte, St. Vrain, Fraser and Blue River watersheds



#### Final Priority with Zones of Concern Map





## **Progress to Date**

- Year 1 7,254 acres completed
- Year 2 9,305 acres (72% completed as of March 2013
- Year 3 7,738 acres targeted
- 66% of acres funded through USFS;
   33% through DW



## **Participation by Other Utilities**

- Aurora \$500,000 for restoration;
   \$200,000 for treatment
- Colorado Springs goal of treating 10,000 acres in the Pike NF
- Northern Water 5 yr. plan with USFS
- Pueblo \$50,000 for treatment in the San Isabel and Pike NFs



# Colorado River Cooperative Agreement

- Five year global negotiation between DW and West Slope parties
- More than \$20 million to be spent in headwaters counties on stream management, habitat, restoration, water quality and forest health
- Surcharge on selected water sales and leases

