



TROUT UNLIMITED'S MISSION IS TO CONSERVE,
PROTECT AND RESTORE NORTH AMERICA'S
COLDWATER FISHERIES AND THEIR WATERSHEDS

Ground Water In Western States

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December 11, 2008



Trout Unlimited & the Western Water Project



- TU is a national NGO with 145,000 members working to protect & restore coldwater fisheries & their habitats.
- Started 10 yrs ago, TU's WWP advocates for state water policy reform & works on the ground w/ local communities to protect & restore healthy flows for trout & salmon.
- Today the WWP is operating in 6 western states (CA, CO, ID, MT, UT, WY) w/ ~ 20 person staff of scientists and lawyers.

Ground Water 101



- In much of the West, ground water is seen as a new source to solve water needs free from the legal complications of surface water.
- **Ground and surface water are connected** and as a result, pumping ground water can adversely affect river flows.
- Over-reliance on ground water can have far reaching consequences:
 - Lower water tables
 - Reduced riparian ecosystems
 - Decreased well yields
 - Impaired water quality
 - Overlying land subsidence

Ground Water Use & Development

- From small, hand-dug wells for 19th C homesteads to the massive wells that now feed irrigation and cities, the West has long relied on ground water to slake it's thirst.
- Irrigation uses by far the most ground water in the West, just as it withdraws the most water in general.
 - Range is from 79% in Arizona to 90% in Colorado



Ground Water Use & Development

- Today, domestic use of ground water is on the rise. Historically it was rural homeowners who drew ground water for drinking, but population growth is now forcing thirsty cities and developments to look for water wherever they can find it.
 - Ground water supplies 40% of Oregon's drinking water.
 - > Wells supply public drinking water systems for 3 million city dwellers and 400,000 rural residents.



Percentage of state population dependent on ground water for domestic water needs. From USGS survey.

Impacts on Fisheries & Wildlife



- Ground water plays a crucial role in maintaining wildlife habitat by contributing water to base flows, playas and wetlands.
- Over-pumping can reduce riparian vegetation and wetlands which provide rearing habitat for young fish and critical stops along the flyways of migratory birds.
 - Washington's ground water irrigation is dropping water levels in the Odessa Aquifer up to ten feet per year directly decreasing surface flows and affecting streams that support threatened Chinook salmon and steelhead.

Western Regulation of Ground Water

- Most state efforts to regulate and manage ground water began in the middle of the 20th C, as pumping increased and the adverse affects of ground water extraction became clear.
- Despite these efforts, **no western state** has adopted a system that completely protects against adverse effects of over-pumping.
 - Every state has a unique approach. Broadly, they fall into two camps:
 - > CO, ID, MT, NM, NV, OR, UT, WA & WY consider ground and surface water as a single resource and practice joint management,
 - > AZ & CA regulate ground and surface water as separate resources.
 - Plus, there are additional legal mechanisms, including the prior appropriation system, geographical exemptions & bans, and attempted restrictions on interstate use of ground water.

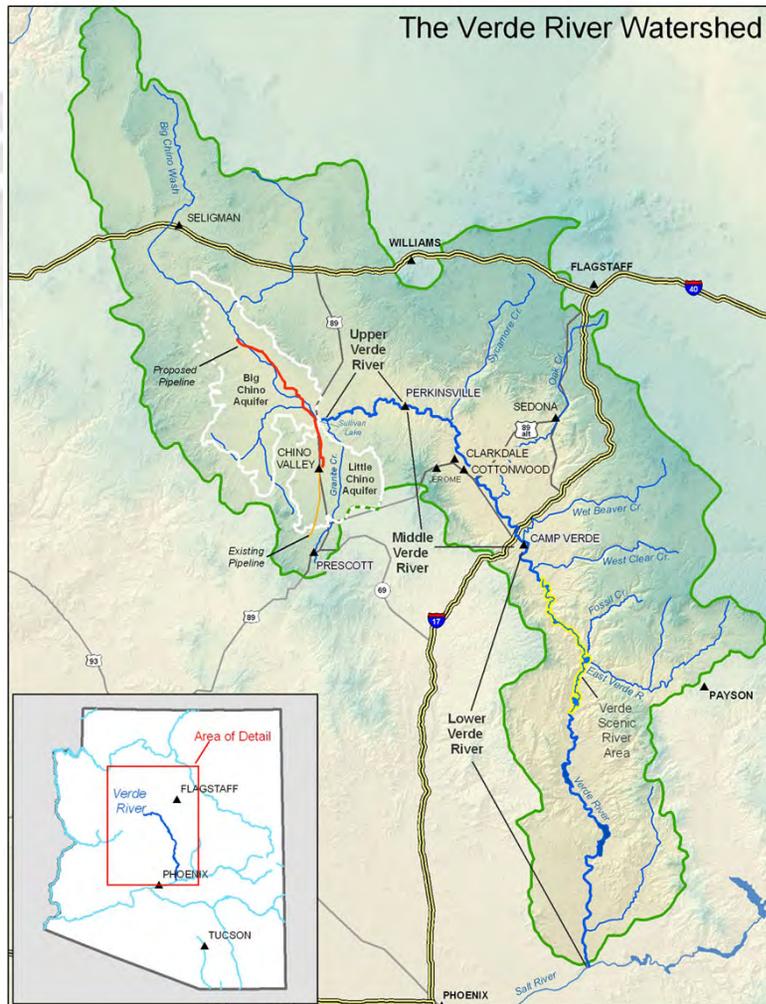


Colorado – an Integrated System



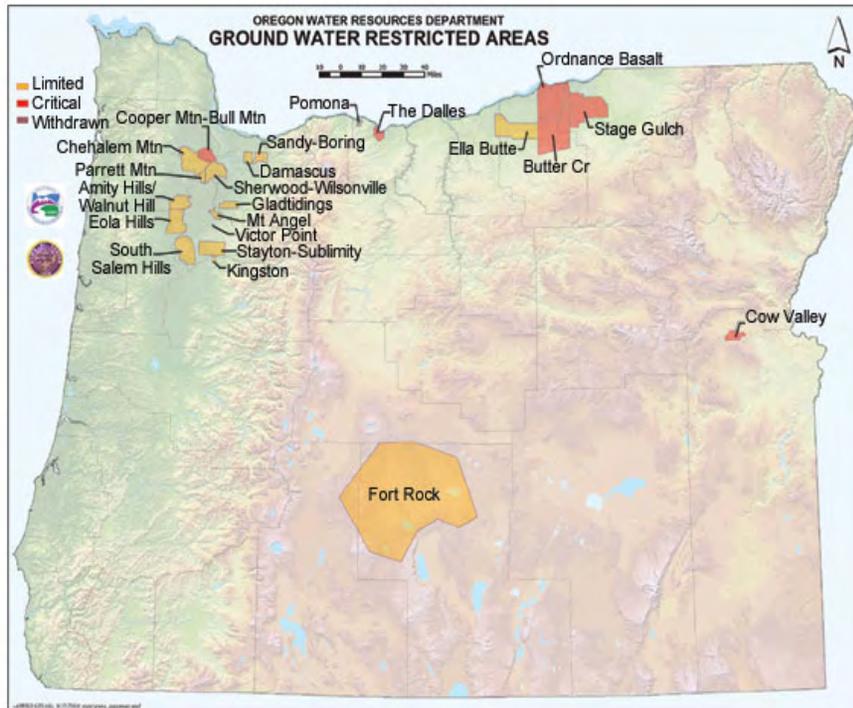
- Since 1969, CO has managed surface & tributary ground water diversions as a single system.
- In April 2006, the CO State Engineer shut down 440 wells irrigating 200 farms across 30,000 acres along the South Platte River.
- Well owners had failed to produce adequate augmentation plans protecting senior city & ag surface water rights holders from injury to their surface & riparian ground water sources.
- While CO's regulation system, on paper, should have prevented this catastrophe, it did not.

Arizona - Separate Regulation



- AZ regulates ground & surface water entirely separately.
- Ground water regulation is concentrated in urban management areas.
- Because state laws do not regulate other ground water diversions, they cannot protect AZ's only Wild & Scenic River, the Verde.
- There are thousands of unmonitored wells in the Verde Valley and the booming city of Prescott plans to build 8 large wells and a 30 mile pipeline to move 2.8 billion gallons a year out of the Big Chino Aquifer which would eventually dry up 24 miles of the Verde's headwaters.

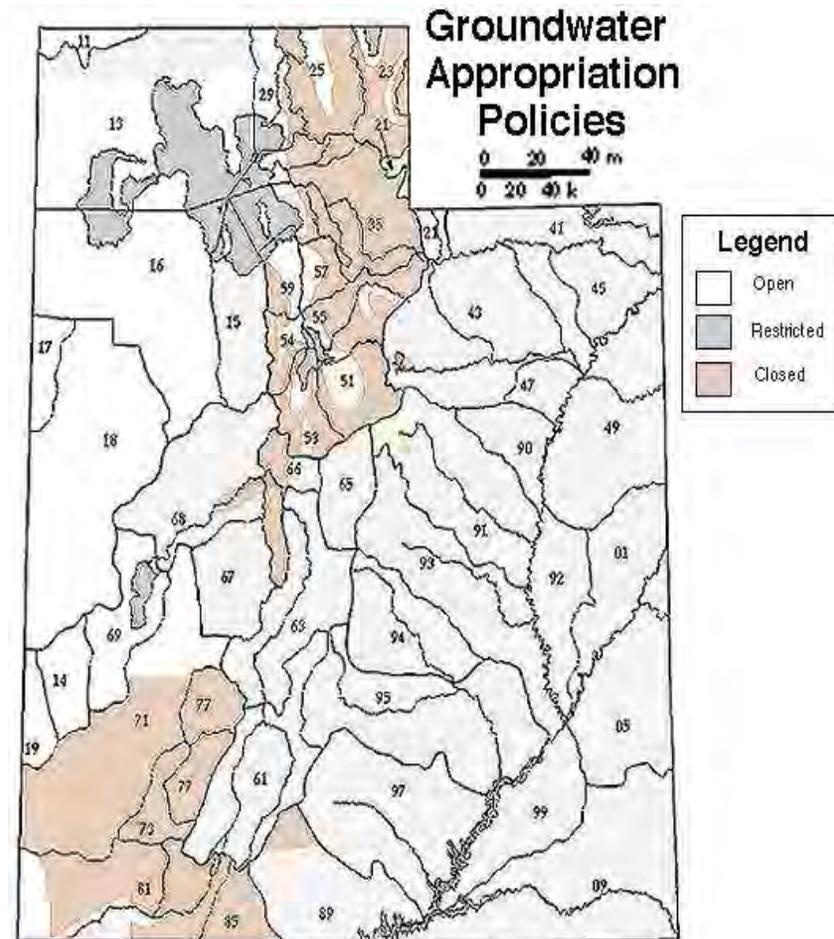
Oregon – Joint Management



- OR manages ground & surface water together, but not formally within the prior appropriation system.
- OR has the authority to designate critical management areas within which it can limit permits for new wells or require mitigation.
- In addition ground water withdrawals affecting scenic waterways are checked to determine if they measurably reduce surface flows.
 - WaterWatch challenged the rules for ground water pumping permits as not protective of stream flows.
 - In May 2005, a state court voided the rules as inconsistent with OR's instream flow protection statutes.
 - In July 2005, on a 27 to 1 vote in the state senate, the legislature reinstated the rules through 2014.

Basin Closures

- AZ, MT, and UT have recognized that the adverse effects of historical ground water pumping have become so severe that the only solution is to ban any additional withdrawals in certain areas.
 - In response to some UT regions over-appropriated ground water the State Engineer closed many of these to new withdrawals. In other parts of UT, however, withdrawals are allowed as long as users provide augmentation sufficient to avoid injury to other water rights holders.



Exempt Wells



- All western states except UT exempt household wells from regulation. While each well is small, the number of household wells is growing rapidly, resulting in ground & surface depletions.
- A 2006 NM law limits exempt wells in highly over appropriated areas.
- In MT, by contrast, legal reviews are only required for small wells (= 35 gpm & 10 af) if piped together.
 - As a result, 10,000's of wells have been drilled without review
 - Large scale subdivision developers rely on this exemption to avoid scrutiny of their development's impacts to nearby rivers



Gallatin Valley, Montana

- In Gallatin Valley, from 1964 to 2002, nearly a third of agricultural land was lost to residential/commercial development.
- Except for Bozeman, Gallatin residents rely on ground water, and the number of appropriations has tripled in the last 20 years.
- Concern over ground water development and its impacts to Gallatin River flows came to a head in 2003 with a developer's application for a new ground water permit for a proposed golf course and resort.
 - Local ranchers and communities opposed the permit which was eventually denied, placing the issue of rapid ground water development firmly in the public eye.
 - This has set the stage for state-wide reform of MT's ground water laws as the legislature considers new subdivision permitting and ways to encourage new tools, such as water banking and aquifer storage and recovery to address increased ground water pumping.



Unregulated Pumping – Resource Extraction



- In WY's Powder River Basin A single CBM well can produce 17,280 gallons per day and over 6 million gallons per year.
- By 2015 there may be 40,000 new CBM wells pumping more than a trillion gallons of water from the aquifer, depleting it at a rate that far exceeds its recharge.
- Produced water “disposal”
 - Re-injection
 - Impoundment or waste pits
 - Discharge to the surface
- In most situations CBM produces so much water that much of it cannot be put to beneficial use essentially wasting significant ground water reserves.

Solutions

- Conservation First
- Sustainable Conjunctive Management
- Aquifer recharge
- Underground Water Banks
- Effective Administration
- Meaningful Augmentation
- Sensible Regulation of Exempt Wells



Conclusion



- The same conservation measures advocated generally for more than a decade offer important ways to help address using ground water to meet increasing municipal & agricultural demand.
- States must address the unsustainable use of ground water with new regulatory systems & management strategies.
- Common sense ground water reform will be needed to allow the West to grow while protecting rivers, springs, fish wildlife and people that depend on them.

- For more information on Trout Unlimited please visit our website at www.tu.org.
- For a PDF copy of our report go to www.tu.org/groundwater.

