Metolius Protection - Reality & Myth: By Tom Davis, PE; February 25, 2009

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The Metolius River and its tributaries are excellent examples of outstanding aquatic and watershed resources, but they are vulnerable to future threats, particularly related to flow, water quality and the impairment of spawning-rearing gravel. The Metolius bull trout have suffered a decline since the 2004 through 2006 period, apparently because of gravel sedimentation and low flows during spawning-rearing periods in the western tributaries where bull trout and their prey, kokanee salmon, spawn. Fly Creek, an isolated Metolius tributary is one of Central Oregon's best sources for pure, native redband DNA. It is small and subject to habitat losses due to low flows, water pollution and sediment. The neighboring Indian Ford and Whychus Creeks are also vulnerable habitats for both existing and reintroduced native salmonids.

The owners of two land speculation properties in the Metolius watershed have asked Jefferson County to zone the properties for destination resorts and will receive such zoning unless Oregon takes action. Because of the superb qualities of the Metolius, Senator Ben Westlund led a 2007 effort in the Oregon Legislature to place an additional exception in the authority given by the State to counties to approve destination resorts. SB 30 would have precluded destination resorts in the Metolius watershed and the adjacent areas that affect the Metolius system. It passed the Senate by a 19 to 11 vote, but Governor Kulongoski threatened to veto it and it died in the House.

The following organizations supported SB 30, or now support the 2009 effort to protect the Metolius through similar action - Central Oregon Flyfishers, Central Oregon LandWatch, Confederated Tribes of Warm Springs, Friends of the Metolius, Native Fish Society, Oregon Backcountry Hunters and Anglers, Oregon League of Conservation Voters, Oregon Natural Desert Association, Oregon State Public Interest Research Group (OSPIRG), Trout Unlimited - Oregon, Trout Unlimited – National, Upper Deschutes Watershed Council, WaterWatch and 1000 Friends of Oregon.

The realities of the issue and the reasons for protecting the Metolius are many, as are the myths used to justify an approval by Jefferson County. This summarizes the realities and myths.

Realities

1. **Existing Fisheries –** The Metolius River contains one of the healthiest populations of the threatened bull trout in the western U.S. Present and healthy are native redband (rainbow) and kokanee salmon that are the progeny of sockeye salmon isolated by Pelton Round Butte. Some brown trout are also present. Wild, pure-native redbands are present in Fly Creek according to fish biologists. The small Metolius tributaries such as First and Lake Creek are important for spawning. Redband trout are present in Whychus Creek. The alevins of bull trout stay in their gravel refuge for up to eight months, so they are very susceptible to damage from erosion-sedimentation (More on this in **11**).

Alevins

2. **Native Redband Genetic Resources –** An important resource at risk is the wild, pure-native redband (rainbow) trout in Fly Creek. Hatchery stocking and hybridization have made the genetic resource of pure, native Metolius redbands rare. Because of the isolation of certain pools in Fly Creek, the small redbands there are wild, native stock, so they are of exceptional value for native fish recovery. The small, isolated pools and reaches

depend on good water quality and the meager groundwater inflow during dry periods. Much of the groundwater and surface water from the Pacific Land and Cattle Company (PLC) property flows toward Fly Creek.

According to Brett Hodgson, District Fisheries Biologist for ODFW (email available upon request): *"Trout Creek and Fly Creek are two streams that harbor small redband populations and have never been stocked. Therefore, from a purity standpoint they are probably the best."* Fly Creek redbands are also discussed in the Deschutes National Forest, 1998 "Fly Creek, Level 2 Stream Inventory".

3. Reintroduced Fisheries –Chinook salmon are being reintroduced and many kokanee will become sockeye again with the new passage facility at Pelton Round Butte. Steelhead are being reintroduced to Whychus Creek, a small stream that has suffered from low flows and high water temperatures for decades, so it is very sensitive to nutrient and other pollutant loads. The good news is that flow and passage restoration is occurring and will be of significant value for the existing fisheries and reintroduced steelhead. Flow and passage restoration is the result of Three Sisters Irrigation District, Deschutes River Conservancy and Upper Deschutes Watershed Council projects.

4. Public and Private Investment – Approximately $300,000,000 is being invested, or planned for investment, to restore habitat in the upper Deschutes system, including Whychus Creek, and to reintroduce salmon and steelhead to the Deschutes up to Big Falls, the Metolius, Whychus Creek and Crooked River. Of this total, at least $100,000,000 would logically be allocated to the Metolius and Whychus.

5. Size - The PLC property includes 30,000 acres. The owners asked for approval of zoning for 10,000 acres to develop a resort on Green Ridge five miles east of Camp Sherman. The lands drain primarily to the lower Metolius and tributaries such as Fly Creek, but also Indian Ford Creek, a Whychus tributary, and the Middle Deschutes. PLC suggested that it might limit development to 2500 units on 3500 acres. Black Butte Ranch is about 1,800 acres and the proposed Thornburgh destination resort is to be a little less than 2,000 acres. The City of Sisters is less than 1,200 acres. A map is at http://noresorts.blogspot.com/2007/05/map-of-metolius-landwatch.html

If the 10,000 acres of PLC property is fully developed as a destination resort, as would be allowed in the county's proposed eligibility map, with 50% open space, the 10,000 acres could have more than 7,500 homes assuming it would be built at the same density as other resorts. Assuming two people per house, the PLC resort could have a population of over 15,000 people at times, and a number of golf courses.

PLC applied for a well field with an annual production of 2,422 acre-feet. This is equivalent to 789 million gallons per year (mgy). The annual water use in Sisters according to the Sisters Public Works Department is roughly 212 mgy, so PLC is planning on using water **3.7 times** that of the City of Sisters. Assuming a moderate water use of 200 gallons per person per day, the 789 mgy is equivalent to 10,800 people. PLC has applied for a peak rate of 8.8 cfs.

Water for PLC wells would reduce critical groundwater/spring flow to the Metolius, Middle Deschutes, Whychus Creek, and important tributaries such as Indian Ford and Fly Creeks. Oregon Water Resources Department policies would do little to avoid or mitigate such impacts. Eroded sediment from PLC construction, stormwater runoff, and discharges to groundwater from wastewater treatment systems (see **9**) would also affect those streams.

The Dutch Pacific (DP) destination resort would be located on 640 acres three miles west of Camp Sherman and one mile north of Suttle Lake. It drains into First and Lake Creeks, which drain into the upper Metolius. Fish biologists have identified Lake Creek as potentially one of the big Chinook salmon producers. The company says there would be 180 lodging units and 450 homes, which in itself would more than triple the current population of Camp Sherman.

Such developments would create more urban interface wildfire problems, and the roads in Deschutes County, Sisters and Camp Sherman would be crowded because of the increase in traffic.

6. Groundwater, Spring Flow and Streamflow – Well pumping would reduce the groundwater/spring flow to the Metolius system. The shallow groundwater systems below the destination resort properties flow in the same general direction as the surface water flow.

The deep groundwater is discussed in the USGS Report "Ground - Water Hydrology of the Upper Deschutes Basin,

Oregon, BY MARSHALL W. GANNETT, KENNETH E. LITE JR., DAVID S. MORGAN, AND CHARLES A. COLLINS; Water-Resources Investigations Report 00–4162. The flow map is at http://or.water.usgs.gov/pubs_dir/WRIR00-4162/fig28_eps_040402.pdf. More on the topic can be found in **A** (attached).

The USGS, in response to a question from Senator Ben Westlund's office, stated: *"In the Metolius River Basin, ground-water pumping most likely will result in diminished discharge at principal spring complexes that occur at the head of the Metolius, along the main stem, along many of the tributaries, and near the confluence of the Metolius and Deschutes Rivers."*

Mark Yinger, R.G. is a hydrogeologist experienced in the hydrogeology of the upper Deschutes basin. He has applied the USGS model to the Metolius-Whychus system and has stated (letter available upon request): *"I can state with reasonable certainty that the primary surface water impact of the Ponderosa Land & Cattle Company resort's groundwater pumping will be to reduce spring discharges to the Metolius River and its tributaries upstream of Jefferson Creek. The pumping will also reduce flows from springs that discharge to lower Whychus Creek. Other waters that may be impacted include Fly Creek and Indian-Ford Creek. … It is reasonable to conclude that the pumping water level in the production wells of the proposed resort will be well below the elevation of the Metolius River headwater springs. The primary surface water influence due to pumping of the production wells will be on the springs that discharge to the Metolius River*."

Groundwater, including future discharges from wastewater systems, flows toward First and Lake Creeks from the DP property. From the PLC property the deep groundwater system flows toward the Middle Deschutes, the lower Metolius and Fly Creek. Much of the shallow system below the property would flow toward Indian Ford Creek.

7. Endangered Species Act (ESA) – Bull trout are listed as threatened under the ESA. The reduction in flow in the Metolius and tributaries such as First and Lake creeks constitutes a "take" under the Endangered Species Act. "Take" is defined in the Endangered Species Act (ESA) as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species. Harm may include significant habitat modification where it kills or injures a listed species through impairment of essential behavior (e.g., spawning or reproduction) so the proposed destination resorts are not in compliance with the ESA.

According to Brett Hodgson (copy of email available): *"Bull trout have never been stocked in the Deschutes basin. Therefore native (pure) bull trout are present in the Metolius-Lake Billy Chinook ecosystem (and middle Deschutes up to Big Falls) and in the upper Deschutes Basin in Odell Lake-Trapper Creek and Odell Creek. As you are aware historically they were much more widely distributed in the upper Deschutes, however, habitat degradation and water management led to their extirpation outside of Odell."*

8. Wild and Scenic Rivers Systems - The Metolius was added to the national system in 1988 in the Omnibus Oregon Wild and Scenic Rivers Act of 1988. It was added to the State Scenic Waterways Program at the same time and is included in the Warm Springs Wild and Scenic Rivers System.

The purpose of the Wild and Scenic River designation as stated in the original Wild and Scenic Rivers Act of 1968 is to ensure that *"certain selected rivers of the Nation, which with their environments, possess outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environs shall be protected for the benefit and enjoyment of present and future generations."* Both the federal and state programs encourage cooperation between agencies to protect the river and its values.

Special protection is also provided in the WARM SPRINGS TRIBAL CODE; CHAPTER 401; WARM SPRINGS WILD AND SCENIC RIVERS ACT; 401.110 Designation of River Protected Areas. The following rivers and the land adjacent thereto are hereby designated as components of the Warm Springs Wild and Scenic Rivers System: (1) Metolius River. The Metolius River from its headwaters to Lake Billy Chinook. (2) Deschutes River. The Deschutes River from its headwaters to its mouth.

9. Wastewater – These two resorts would bring thousands of people into a watershed draining into one of the world's highest quality streams and fisheries – the Metolius River. Thousands of toilets discharging to the

groundwater from wastewater systems would kill the Golden Egg Goose.

Assuming 2-persons/dwelling, the people contributing sewage to the watersheds could range from 5,400 to 16,000 at the two resorts during peak occupancy. At 50 gal/person/day wastewater; 7.0 lbs N/person/yr (46 mg/l) and 90% leaching to groundwater – the two resorts would contribute approximately 34,000 to 100,000 lbs of nitrogen to the groundwater annually. The amount depends on a number of factors, including the type of treatment systems, number of units, quality of installation and maintenance, and soil/geology, but the nitrogen loading would be significant. Sewers and central treatment would need advanced, or tertiary treatment to reduce the threat and disposal would still be an issue. Golf courses, lawns and landscaping would add more nitrogen to the groundwater.

10. Water Quality – The impacts on groundwater quality from pollutants such as nitrogen, household chemicals and bacteria would be significant, but the primary threat would be to the surface waters that the groundwater systems discharge to. These include the Metolius and tributaries such as First, Fly and Lake Creek; and Whychus Creek and its tributary Indian Ford Creek. Additional nitrogen, even in extremely low quantities, can cause algal blooms, excessive plant growth, oxygen depletion, changes in pH, and other important changes that are detrimental to aquatic ecosystems. It is important to note that the guideline for nitrogen in drinking water is 10 mg/L, but the guideline for total nitrogen in freshwater (i.e., streams) is 0.12 mg/L, or 1/80th the drinking water guideline.

Metolius water quality is generally excellent, but it and some of the tributaries are currently on the Oregon "303d Listed Streams" list, meaning that they are in violation of Oregon water quality standards. In a letter dated November 2, 2007 to Governor Kulongoski the Oregon Department of Environmental Quality stated, "*Subsurface discharge to shallow soils or land application to the surface of soils may be allowed. Even with substantial removal of nutrients and other constituents from this wastewater prior to discharge, small amounts of nutrients may reach the Metolius River or its tributaries through runoff or seepage to groundwater that flows into the Metolius. The river is sensitive to nutrients, and small increases in nutrients could result in some degradation of water quality, such as decreased dissolved oxygen, increased aquatic plant growth, and changes in pH, among others.*"

11. Erosion and Sedimentation – The soil disturbances necessary during construction create exceptionally high surface erosion rates. The soils in the area are very erodible and construction would occur over a long period. Erosion, i.e. the initial movement of soil, and the resulting particle transport and sedimentation of spawning gravel in the Metolius and tributaries would be severe and enduring. Since most of the worst impacts result from bed-load particle movement, much of the phenomenon isn't detected through standard water quality monitoring per se, and therefore usually escape enforcement of Oregon water quality law. More on the topic in **B** (attached).

12. Tax Base –Jefferson County might take in some additional money but Deschutes County and the Sisters community would bear most of the cost burdens of traffic, new roads and other development impacts because of the isolated nature of the Metolius watershed from service centers of Jefferson County.

13. The Destination or The Resort – The land speculators and Jefferson County may be able to profit from exploiting the Metolius with resorts. But the sacrifice of one of the Nation's most valuable natural treasures is too great a price to pay. There's plenty of land in Central Oregon for resorts and we already have too many. Creating unnecessary threats to the destinations doesn't make sense.

Myths

Myth 1 - No Groundwater Problem *"…. it belies science to say development 20 miles downstream will somehow dry up the headwaters."* Quoting Rick Allen, a former Madras mayor who lobbies for PLC (Bend Bulletin article - May 23, 2007)

The following is from the USGS response to questions from Senator Westlund's office. More on this is in **A.**

This leads to your second question: 'Would these possible effects relate to the flow strength of springs in the area... especially the Metolius headwaters?' … Once the cone of depression stabilizes, the discharge of ground water from the well must be offset by diminished discharge of ground water to springs, streams, and wetlands elsewhere, or by increased flow to the aquifer system from other boundaries… In the Metolius River Basin, ground-water pumping most likely will result in diminished discharge at principal spring complexes that occur at the head of the Metolius, along the main stem, along many of the tributaries, and near the confluence of the Metolius and Deschutes Rivers."

Myth 2 - Property, Homes, Farms and Land Speculation – Some argue that all property is the same regarding property rights, but that's obviously wrong, as are most black and white ideologies. Your home is your castle, and that's at the highest level of rights to property. The rights to work your family land for food, clothing or shelter are not far behind. But even home and family-farm property "rights" have constraints, such as not polluting public air, land, water, fish or wildlife.

The lands proposed for destination resorts in the Metolius are speculation properties. They're like pork bellies on the futures market, not like your home or family farm. The argument that the public shouldn't regulate what can be done with speculation properties is specious. That's like saying the public shouldn't regulate concentrated animal feeding operations, i.e. CAFOs, because it would interfere with someone's speculation on pork bellies. And like CAFOs destination resorts aren't appropriate everywhere, particularly in the Metolius. To equate the Metolius speculation lands with your home denigrates your home and the destination jewels that are at risk – the Metolius and Whychus.

Myth 3 – Oregon Would Be Pre-empting Local Land Use Control – Oregon has delegated authority to local governments to implement certain state responsibilities. This includes land use controls such as the Destination Resort law (ORS 197.455). All delegations of such authority include exceptions to protect the broader public interest. Oregon can add exceptions to such authority to protect special, high-value resources such as the Metolius and Whychus watersheds. This is nothing new. For example, Oregon pre-empted local jurisdictions from attempting to control timber harvest methods on private lands (ORS 527.722).

Current exceptions or preclusions in the destination resort law (ORS 197.455) are: within 24 air miles of an urban growth boundary with an existing population of 100,000 or more; on a site with 50 or more contiguous acres of unique or prime farmland; within three miles of a high value crop area; on Class 1 or 2 forestlands; in the Columbia River Gorge National Scenic Area; and in sensitive big game habitat areas as determined by ODFW. The Legislature also pre-empted cities from annexing specific properties in White City, Medford and Beaverton and removed the authority of local governments to site prisons or energy facilities. Oregon also controls water rights, water quality and the public's fish and wildlife resources. For Oregon to protect the public's resources it must protect against watershed disturbances that seriously threaten them.

Myth 4 – This is a NIMBY Issue – Not-In-My-Back-Yard is a strawman argument. The developments would not be close to most of the thousands of Oregonians who oppose the proposed destination resorts.

Myth 5 – This is a "Pull Up The Gangplank" Issue – Those who live in the Camp Sherman area value the low population density, but primarily they value the fish, wildlife and natural area around them that they act as stewards for. The issue would have died early if the reason for concern was "Pull-Up-The-Gangplank".

Tom Davis, PE

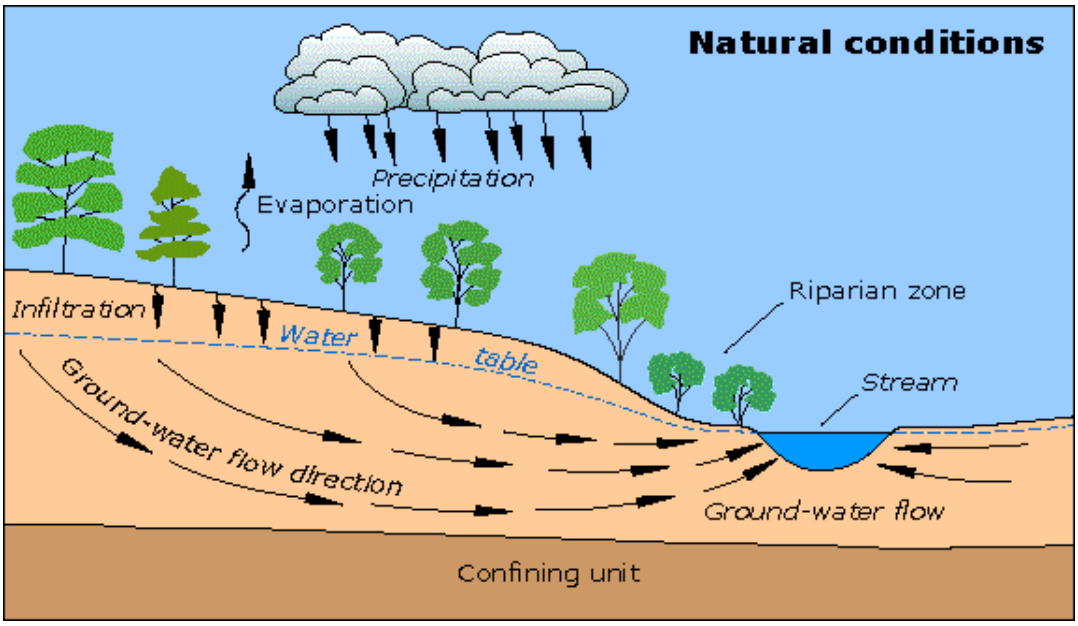
Native Fish Society
Volunteer River Steward
Upper Deschutes

A - Groundwater Flow & Quality Issues (as related to Proposed Metolius Resorts)

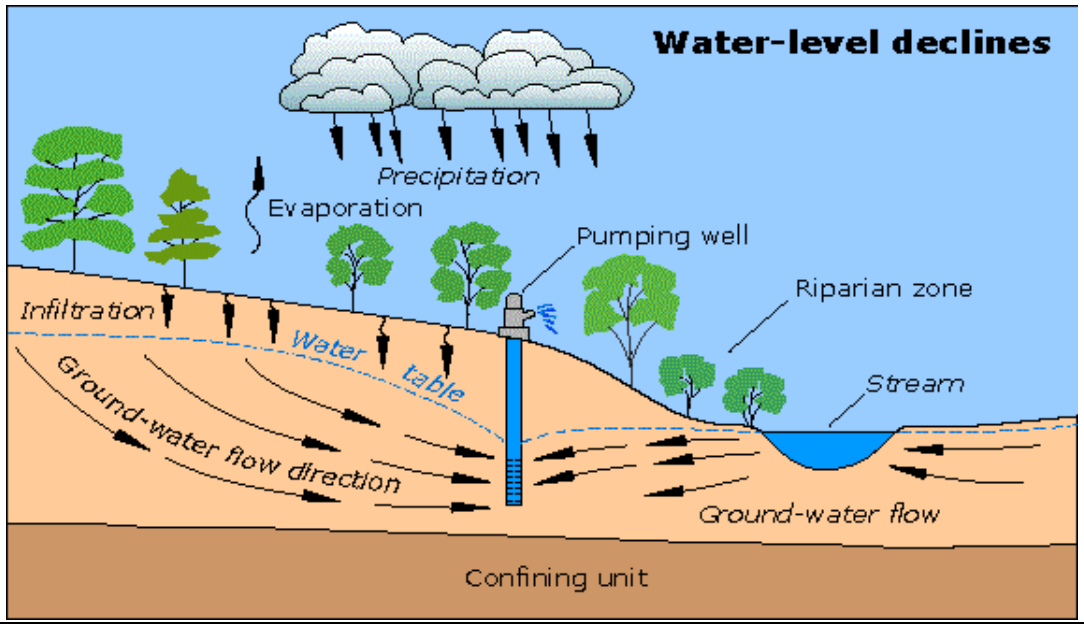
This USGS discussion addresses typical groundwater flow systems similar to the ones affected by the two Metolius resort proposals. An Upper Deschutes flow map is at http://or.water.usgs.gov/pubs_dir/WRIR00-4162/fig28_eps_040402.pdf.

Groundwater flow and effects of pumping (USGS) http://ga.water.usgs.gov/edu/earthgwdecline.html

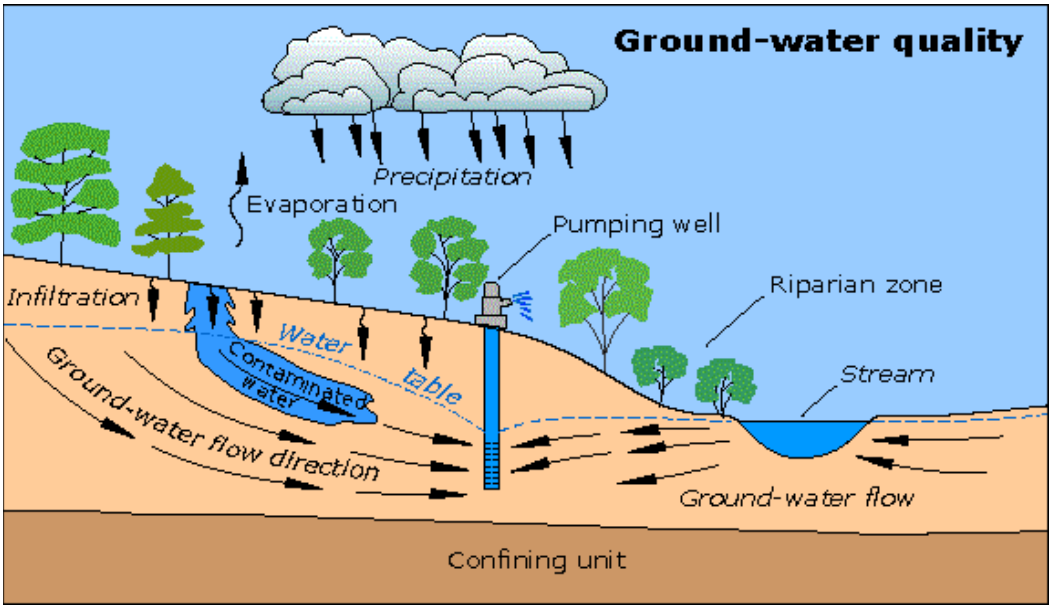
Water is recharged to the ground-water system by percolation of water from precipitation and then flows to the stream through the ground-water system.



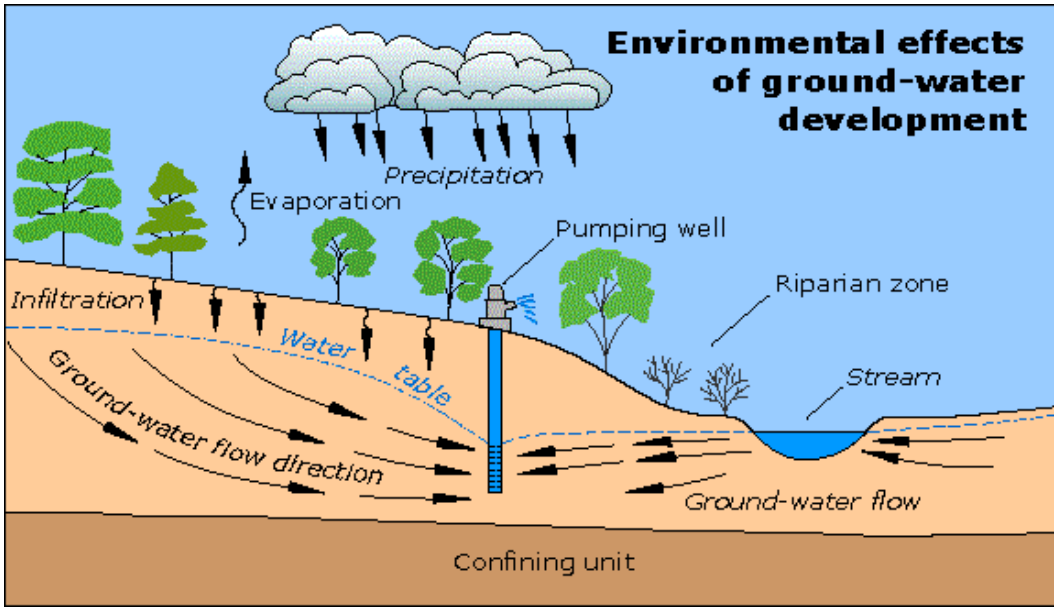
Water pumped from the ground-water system causes the water table to lower and alters the direction of ground-water movement. Some water that flowed to the stream no longer does so and some water may be drawn in from the stream into the ground-water system, thereby reducing the amount of streamflow.



Contaminants introduced at the land surface may infiltrate to the water table and flow towards a point of discharge, either the well or the stream. (Not shown, but also important, is the potential movement of contaminants from the stream into the ground-water system.)



Water-level declines may affect the environment for plants and animals. For example, plants in the riparian zone that grew because of the close proximity of the water table to the land surface may not survive as the depth to water increases. The environment for fish and other aquatic species also may be altered as the stream level drops.



The proposed Metolius destination resorts will affect and create similar groundwater flow systems. Flow will be affected in the Metolius, Whychus and Middle Deschutes surface waters. The contaminants from wastewater, lawns and golf courses such as NO3-N, pesticides, fertilizers, household chemicals and herbicides would be carried to the streams, including Fly, Lake, First and Indian Ford Creeks; and the Metolius River. Additional nitrogen, even in extremely low quantities, can cause algal blooms, excessive plant growth, oxygen depletion, changes in pH, and other important changes that are detrimental to aquatic ecosystems. It is important to note that the guideline for nitrates in drinking water is 10 mg/L, but the guideline for total nitrogen in freshwater (i.e., rivers and creeks) is 0.12 mg/L.

B - Erosion & Sedimentation (as related to the proposed Metolius resorts)

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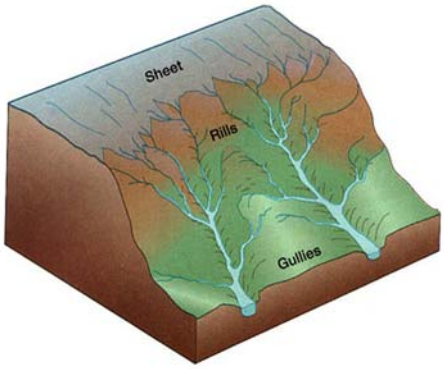

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3

1 – Natural section of Little Three Creek

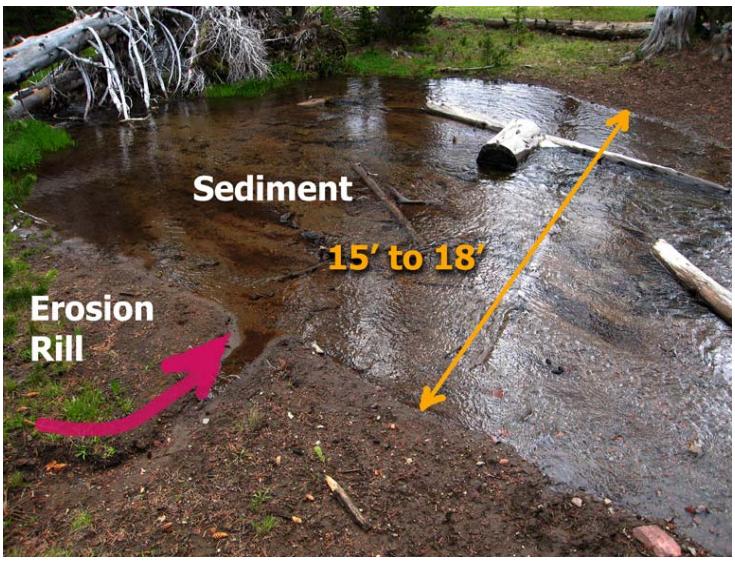
2 – Graphic showing surface or sheet erosion

3 - Surface Erosion rill along Little Three Creek – 06-07-07 - This is an example of recent surface erosion from exposed soils similar in erosion qualities to the soils in the Metolius and Whychus Watersheds. This is from a low-impact trail between Three Creek Meadow and Little Three Creek Lake. Significant thunderstorms had occurred during the preceding week or so. This erosion and rill-transport example begins 200' to 300' from the stream, but similar erosion, i.e. soil particle displacement, miles from a stream initiates the transport of sediment that will eventually enter the stream.

4 – Sediment deposition from the eroded material that was transported by the rill shown in **3**. The Creek here is roughly 15' to 18' wide and 1/5th the depth of the healthy section in **1**.

Sedimentation from the proposed Metolius resorts would be significant from the new soil disturbances associated with construction activities. The construction would go on for many years/decades since the developers would "open" new units as sales progressed. Even if it all occurred during one year, eroded sediment would be transported through the watershed and delivered to streams for decades. Accelerated stream sedimentation, particularly the downstream movement as **bed-load** and deposition over spawning-rearing gravel, is very detrimental to fishery health. It would be of major concern in the small First, Lake, Fly and Indian Ford Creeks, but eventually in the Metolius and Whychus too.

Walt Megahan led much of the pertinent Forest Service research on surface erosion from construction on erodible soils. The same processes occur on most types of erodible soils. Walt "peer-reviewed" three of my consultant projects that addressed this issue, and was a sub-consultant on another. The erosion rates are high on sandy soils such as in the west side Deschutes watersheds. The fine sediment usually moves suspended through the system quickly, but the sand and fine gravel moves slowly as bed-load, bouncing and creeping along the streambed. The continual movement devastates eggs and alevins in the spawning gravel and defies standard water quality regulations and monitoring. It would be particularly damaging to Metolius tributaries such as Lake, First and Fly Creeks. The science is clear but widely ignored.



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