Oregon Water Coalition
Member Newsletter

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February, 2013 **oregonwatercoalition.org** **Volume 20, Issue 2**

Water unlocks productivity, brings added value to Eastern Oregon farmland

With its sandy soils and arid climate, Eastern Oregon's Umatilla Basin boasts some of the most productive farmland in the world.

From potatoes to onions, corn to peas, watermelons to blueberries, the region is an oasis of high-value crop production.

Just add water, and crops flourish here. Water, however, is hard to come by.

More than 5 trillion gallons of Columbia River water rushes past Umatilla Basin farms each year on its way to the Pacific Ocean. Most of that never leaves the river. It is dedicated for endangered salmon runs and hydroelectric generation.

Groundwater is also largely off-limits to Umatilla Basin farmers. The basin has four of the state's seven critical groundwater areas. Consequently, two-thirds of the roughly 190,500 acre-feet of groundwater rights held by Umatilla Basin farmers are no longer functional.

Typically, it takes 3 acre-feet of water -- an acre-foot is enough water to cover 1 acre 1 foot deep -- to irrigate 1 acre in the Umatilla Basin. Using those figures, more than 42,000 acres of potentially high-value cropland is left dry each year because of a groundwater shortage.

In addition, a study by the Oregon Water Resources Department showed the Umatilla Basin contains another 200,000 nonirrigated acres that have promise as high-value farmland.

The studies show the area is operating at a fraction of its economic potential.

"Without water, you move from a crop that is worth thousands of dollars an acre to a crop worth only hundreds an acre," said Tyler Hansell, a Hermiston, Ore., farmer.

Craig Reeder, farm manager for Hale Farms in Echo, Ore., equated each acre-foot of water to a $25,000 increase in value for farm production.

"The higher value crop we raise, the more value we can add to it," Reeder said. "Instead of just growing a commodity, like wheat, we can take raw product to a processing plant, put it in containers and ship it overseas."

A 2006 study estimated that recharging the basin's aquifers with an additional 100,000 acre-feet of water -- enough to irrigate about 33,000 acres -- would stimulate the basin's economy by $344 million, create more than 2,000 jobs and add $5 million to annual state tax revenue.

Gaining that extra 100,000 acre-feet, however -- a fraction of the water that flows past here every day in the Columbia River -- has proven difficult.

"My dad and his generation fought this battle," said Hansell, 34. "Now it's our issue."

Many of the problems facing farmers in the basin today can be traced to their ancestors. Farmers started digging wells in the Umatilla Basin in the 1920s. By the 1970s, farmers had overused the water. A decade later, the state started cutting them off from their full allocation of groundwater.

Several efforts to tap the Columbia River for irrigation have surfaced in the Oregon Legislature in recent years, but all have been stifled, and the river remains off-limits to new summer water withdrawals.

One project endorsed

Only one Umatilla water project has been endorsed by lawmakers in recent years -- the Umatilla aquifer recharge project -- and, to date, no new irrigation supplies have been forthcoming from it.

Still, environmental advocates, policy-makers and water users are encouraged by the project.

The project largely uses existing infrastructure, including pumps and irrigation canals, to divert water from the Columbia River in the fall, when river flow is high, to an infiltration site, where it seeps into an aquifer.

If all goes as planned, the project could increase flows in

the Umatilla River in the summer, benefiting fish as well as irrigators, according to J.R. Cook, executive director of the Umatilla Basin Water Commission. Cook tracks the movement of the water through over 50 sensor wells.

However, the costs of diverting water to the infiltration site and then to farms where it can be used are steep, Cook said. But growers have said they are willing to pay high prices in the hopes a little water can make the difference in their ability to produce a high-value crop.

Ultimately, though, Cook said he needs to do more testing to determine what the water is worth, where it is going and how long it takes to get there after it seeps through the sandy soil. And, Cook said, the 25,000 acre-feet that he can provide are well short of what area farmers have requested.

A new hope

A recent development has renewed hope among farmers that more water could be coming to the region. Last year, Gov. John Kitzhaber designated efforts to develop water supplies in the Umatilla Basin an Oregon Solutions Project, or a governor's priority. The governor subsequently created a taskforce to study the issue.

Called CRUST, for Columbia River-Umatilla Solutions Taskforce, the panel is expected in coming days to forward a list of projects it recommends the state consider advancing.

Among recommendations reportedly endorsed by the panel is one that calls for continued funding for the Umatilla Basin aquifer recharge project.

The panel also is expected to recommend considering moving forward on a plan to repair the Wallowa Lake Dam and constructing a new storage reservoir in Juniper Canyon, which would create just under 50,000 acre-feet of storage.

Other projects it reportedly endorses include leasing water from Washington to serve as a mitigation bank for new water rights in Oregon, and partnering with Washington, and possibly Idaho, on new water storage projects.

The group is expected to release its final report after its last meeting Jan. 29.

Also, Gov. Kitzhaber in his proposed budget has recommended pumping $12 million in bond financing for water development into the Umatilla Basin.

The basin, with its vast untapped economic potential and critical salmon habitat, represents a prime test case for determining how Oregon can advance farm productivity while protecting the environment, according to Richard Whitman, Kitzhaber's natural resources policy director.

"That is the model we are looking at for other parts of the state, as well," Whitman said.

Joe Whitworth, president of the Freshwater Trust, also views the Umatilla Basin as a prime test site.

"I think the opportunity to get agriculture more profitable and provide some economic and environmental gain lives in the Umatilla," Whitworth said.

The $12 million Kitzhaber wants lawmakers to provide in bond financing for the basin is part of $22 million he has proposed for statewide water development projects.

In total, Kitzhaber's proposed water development funding package is only about 10 percent of the $200 million Washington recently allocated water development projects. However, Whitman said, it represents an important first step.

"Part of the message here is we need to do everything we can, not just those large-scale projects, but we really need to be doing a lot of small projects that we can bring to fruition in a shorter period of time," Whitman said.

The governor's commitment to water-supply development is encouraging for many who have struggled for years to highlight the need for more irrigation supplies.

"For the first time in a long time, we have requests for funds for a water-supply development program," said Brenda Bateman, spokesperson for the Oregon Water Resources Department. "That includes above- and below-ground storage, interstate partnerships to gain access to stored water and other strategies. And we just haven't had those kinds of strategic conversations in a very long time."

More water storage, Hansell said, means security for his operation -- and for his son's.

"It is always an unsecured future if you don't have water in the desert," Hansell said. "Without it you have nothing."

Mitch Lies, Capital Press, 1/18/2013

Hope rises for irrigation deal, coalition agrees to discuss more river water

The latest effort to develop new irrigation water for Umatilla Basin farmers could provide a breakthrough in what has been a long-standing stalemate between farmers, environmentalists and other fish interests.

At a symposium on Columbia River water at the Northwest Agricultural Show Jan. 29, Craig Reeder, a Umatilla Basin farmer, said a broad coalition is prepared to sign a declaration of cooperation that could increase irrigation supplies in the basin for the first time in two decades.

The two-hour symposium included presentations by Environmental Protection Agency official Mary Lou Soscia, Paul Lumley, executive director of the Inter-Tribal Fish Commission, and consultant Ed Sheets.

The symposium was sponsored by Capital Press, Oregon Public Broadcasting and the Northwest Agricultural Show.

Reeder, chief financial officer for Hale Farms, said the coalition effort marks the first time "a really broad stakeholder base got together to talk about all the issues."

Representatives of tribes, ports, municipalities, environmental groups and water users are prepared to sign the agreement, Reeder said.

The effort -- the latest in several attempts to increase irrigation supplies in the basin -- was named an Oregon Solutions Project last year, making it a priority of Gov. John Kitzhaber. The governor convened the diverse group of stakeholders in the fall.

Reeder, who is part of the coalition, said the group plans to sign the declaration in mid-February.

Included in the agreement are calls to work with other states and Canada, he said. "We're (also) going to work with storage projects ... (implement) additional conservation measures, just to make sure that we are being as efficient as possible," he said. "And then the state is going to offer up some administrative resources."

Kitzhaber is proposing the 2013 Legislature provide funds to help move the measures forward, according to Reeder.

Reeder said the irrigators decided to take additional summer withdrawals off the table early on, which helped move discussions forward.

Environmentalists, tribes and other fish interests have long opposed additional summer water withdrawals from the Columbia River, contending that diverting water for irrigation in spring and summer months could harm endangered salmon runs.

Reeder also said he read books on salmon and tried to see the issues from the perspective of tribes and environmentalists.

"I've gained a tremendous amount of respect for the other side," Reeder said.

Lumley, a citizen of the Yakama Nation Confederated Tribe, said Reeder's approach was vital in moving negotiations forward.

"If we approach the tribes more as a partnership in this agreement and less as adversaries I think there might be a way for us to reach (consensus)," Lumley said.

"I've seen it happen in the Deschutes, the Yakama and (with) the Nez Pearce tribe," he said. And now, possibly, the Columbia.

Mitch Lies, Capital Press, 2/1/2013

Report calls water for crops a priority, plus energy, labor costs, tax relief

The Oregon State Board of Agriculture has identified access to irrigation water as Oregon agriculture's top priority over the next two years in its biennial report to the governor and state Legislature.

Other priorities in the report's Top 10 list include increasing agricultural sales and providing relief from the high costs of taxes, energy and labor. This report should help the reader understand where Oregon is competitive and where it is not; what things are going well and where challenges exist; and what the Legislature, governor, congressional representatives and Oregon citizens can do to help," the board stated in a prepared comment. The 55-page report is now published and available online at **www.oregon.gov/ODA**.

Mitch Lies, Capital Press, 2/1/2013

USGS report details 'patterns of declines' in Columbia Plateau groundwater

Geologic barriers, the intermixing of water between aquifers through wells, and groundwater pumping contribute to the pattern of declines of groundwater levels of the Columbia Plateau, according to a report published by the U.S. Geological Survey.

Groundwater from the 44,000-square-mile Columbia Plateau Regional Aquifer, a system in decline since the 1970s, is a critical resource for the nearly 1.3 million people in Idaho, Oregon, and Washington, as well as providing irrigation water for the region's estimated $6 billion-per-year agriculture.

"This study is a beautiful example of USGS scientists doing what we do best: making detailed measurements over a broad region, combining those observations with historical information, interpreting the data within a geologic context, including the use of geologic analogues, and working well with local partners," said USGS Director Marcia McNutt. "Understanding the cause of the groundwater declines is the important first step in solving the problem."

To help resource managers in the region, the USGS Groundwater Resources Program began a study in 2007 of the Columbia Plateau Regional Aquifer System to answer key questions about widespread water-level declines, reductions in groundwater flow into rivers, and the as-yet unknown effects of a changing climate on groundwater resources.

As part of this effort to document changes in the aquifer system, scientists compiled water levels measured in about 60,000 wells over the last 100 years. From a subset of the collected information, scientists developed a groundwater-level trend map for a period of widespread groundwater level changes (1968 to 2009). The average rate of change for all wells was 1.9 feet per year of decline, with 72 percent of all wells declining. Scientists also analyzed water-level data to define areas of similar groundwater flow conditions. The areas of focus for this analysis included two large areas of continued concern for locals and state agencies: the Umatilla area, Oregon, and the Palouse Slope/eastern Yakima Fold Belt in the Columbia Basin Ground Water Management Area consisting of Adams, Franklin, Grant, and Lincoln Counties, Washington.

Scientists found that in these areas groundwater levels have declined hundreds of feet and that geologic barriers to groundwater flow protect some areas from decline while making declines in other areas more severe. Evidence suggests that both groundwater pumping and leakage of groundwater between aquifers through long open intervals in wells may be contributing to the observed groundwater level changes.

Information gathered in the study was used to identify groundwater flow paths and major barriers to groundwater flow. Understanding the features that control the direction of flow will help scientists build a groundwater flow simulation model that water managers can use to test ways of managing the region's groundwater under different development and climate conditions.

Agencies cooperating in the collection of groundwater data used in the Columbia Plateau Regional Aquifer study: Columbia Basin Ground Water Management Area, Confederated Tribes of the Umatilla Indian Reservation, Oregon Water Resources Department, U.S. Department of Energy, Walla Walla Basin Watershed Council, and Washington State Department of Ecology.

Columbia Basin Bulletin, 2/8/2013

Study suggests Salmon find their home rivers through magnetic imprinting

When migrating, sockeye salmon typically swim up to 4,000 miles into the ocean and then, years later, navigate back to the upstream reaches of the rivers in which they were born to spawn their young. Scientists, the fishing community and lay people have long wondered how salmon find their way to their home rivers over such epic distances.

A new study, published in this week's issue of Current Biology at **www.cell.com/current-biology/** suggests that salmon find their home rivers by sensing the rivers' unique magnetic signature. As part of the study, the research team used data from more than 56 years of catches in salmon fisheries to identify the routes that salmon had taken from their most northerly destinations, which were probably near Alaska or the Aleutian Islands in the Pacific Ocean, to the mouth of their home river -- the Fraser River in British Columbia, Canada.

This data was compared to the intensity of the Earth's magnetic field at pivotal locations in the salmon's migratory route.

The Earth has a magnetic field that weakens with proximity to the equator and distance from the poles and gradually changes on a yearly basis. Therefore, the intensity of the magnetosphere in any particular location is unique and differs slightly from year to year.

Because Vancouver Island is located directly in front of the Fraser River's mouth, it blocks direct access to the river's mouth from the Pacific Ocean. However, salmon may slip behind Vancouver Island and reach the river's mouth from the north via the Queen Charlotte Strait or from the south via the Juan De Fuca Strait.

Results from this study showed that the intensity of the magnetic field largely predicted which route the salmon used to detour around Vancouver Island; in any given year, the salmon were more likely to take whichever route had a magnetic signature that most closely matched that of the Fraser River years before, when the salmon initially swam from the river into the Pacific Ocean.

"These results are consistent with the idea that juvenile salmon imprint on (i.e. learn and remember) the magnetic signature of their home river, and then seek that same magnetic signature during their spawning migration," said Nathan Putman, a post-doctoral researcher at Oregon State University and the lead author of the study.

It has long been known that some animals use the Earth's magnetic field to generally orient themselves and to follow a straight course. However, scientists have never before documented an animal's ability to "learn" the magnetic field rather than to simply inherit information about it or to use the magnetic field to find a specific location.

This study provides the first empirical evidence of magnetic imprinting in animals and represents the discovery of a major new phenomenon in behavioral biology.

In addition, this study suggests that it would be possible to forecast salmon movements using geomagnetic models--a development that has important implications for fisheries management.

Putman says scientists don't know exactly how early and how often salmon check the Earth's magnetic field in order to identify their geographic locations during their trip back home. "But," he says, "for the salmon to be able to go from some location out in the middle of the Pacific 4,000 miles away, they need to make a correct migratory choice early--and they need to know which direction to start going in. For that, they would presumably use the magnetic field." Putman continues, "As the salmon travel that route, ocean currents and other forces might blow them off course. So they would probably need to check their magnetic position several times during this migration to stay on track. Once they get close to the coastline, they would need to hone in on their target, and so would presumably check in more continuously during this stage of their migration."

Putman says that once the salmon reach their home river, they probably use their sense of smell to find the particular tributary in which they were born. However, over long distances, magnetism would be a more useful cue to salmon than odors because magnetism--unlike odors--can be detected across thousands of miles of open ocean.

Like other Pacific salmon, sockeye salmon spawn in the gravel beds of rivers and streams. After the newly hatched salmon emerge from these beds, they spend one to three years in fresh water, and then they migrate downstream to the ocean.

Next, the salmon travel thousands of miles from their home river to forage in the North Pacific for about two more years, and then, as well-fed adults, they migrate back to the same gravel beds in which they were born.

When migrating, salmon must transition from fresh water to sea water, and then back again. During each transition, the salmon undergo a metamorphosis that Putman says is almost as dramatic as the metamorphosis of a caterpillar into a butterfly. Each such salmon metamorphosis involves a replacement of gill tissues that enables the fish to maintain the correct salt balance in its environment: the salmon retains salt when in fresh water and pumps out excess salt when in salt water.

Salmon usually undertake their taxing, round-trip migration, which may total up to 8,000 miles, only once in their lives; they typically die soon after spawning.

Salmon originating from Oregon that have spent two to four years in the northern Pacific Ocean off Canada or Alaska would return as adults, the scientists speculate, journeying southward off the coast until they reached a magnetic field intensity similar to that of their youth.

"That should get them to within 50 to 100 kilometers of their own river system and then olfactory cues or some other sense kicks on," said Putman, who conducts research in OSU's Department of Fisheries and Wildlife. "Salmon are a cold-water fish, and all things being equal, they prefer cold water," said Putman, who earned his

Ph.D. in biology from the University of North Carolina at Chapel Hill. "But the fact that they also demonstrate geomagnetic fidelity in choosing a route shows that this could be a major instrument in their biological toolbox to guide their way home."

Putman said that his previous studies of the Columbia River have shown that the magnetic intensity shifts less than 30 kilometers in either direction over a period of three years, which is about the length of time many salmon spend in the ocean. "Salmon have to get it right because they only have one chance to make it back to their home river," Putman said, "so it makes sense that they may have more than one way to get there. The magnetic field is amazingly consistent, so that is a strategy that can withstand the test of time. But they may also use the sun as a compass, track waves breaking on the beach through infrasound, and use smell."

Putman and OSU fisheries biologist David Noakes plan to follow through with experiments on varying the magnetic field for salmon in a laboratory setting, using the Oregon Hatchery Research Center in Oregon's Alsea River basin.

Columbia Basin Bulletin, 2/8/2013

Voluntary actions to increase flows help Shasta River fall Chinook return

Near-record numbers of chinook salmon returned successfully to the Shasta River last fall despite daunting, drought-related environmental conditions and a large number of migrating fish that increased the threat of disease.

The California Department of Fish and Wildlife counted more than 29,000 adult chinook salmon at video camera monitoring sites and fish weirs, making the return the largest on the Shasta River since 1962.

"Irrigation districts and individual landowners stepped up and contributed water to reduce disease risks to returning salmon," said Neil Manji, CDFW regional manager. "The increased flow helped cool the river water and avert disease and a potential salmon kill."

Drought conditions combined with large numbers of salmon, low stream flow and high temperatures posed a potential disease threat in the lower reaches of the Shasta River in September.

In 2002, similar environmental conditions caused more than 30,000 salmon and steelhead to die downstream in the lower Klamath River due the outbreak of two diseases, columnaris and Ichthyophthirius multifiliis or "Ich."

With flows low in early September, large numbers of salmon began returning to the Shasta River. Irrigation season was slated to continue until Oct. 1, which could have caused further reductions in river flows. Over a half dozen key landowners and irrigators with water rights recognized the threat and decided to reduce diversions from the Shasta River to increase flow in the river.

At one juncture their contributions increased the river flow to 44 cubic feet per second more than doubling the flow.

This helped move salmon through the system and reduce the vulnerability to disease outbreaks that are a threat when fish are highly concentrated. Increased flow also helped disrupt the life cycles of lethal disease pathogens.

CDFW environmental scientists closely monitored the health of returning salmon and reported no significant disease outbreaks.

The impressive return of chinook salmon last fall year is attributed to good conditions in the ocean, where salmon live and feed for up to three years, and excellent juvenile reproduction and out-migration success to the ocean.

Environmental improvement projects throughout the watershed, including water diversion screening and riverbed enhancements, may also have contributed to this year's return.

Columbia Basin Bulletin, 1/25/2013

Preseason Coho return forecast estimate shows more fish than last year

Coho salmon returns this late summer to the Columbia River and to Northwest coastal streams should be up a bit this year according to a preseason ocean abundance forecast completed by the Oregon Production Index Technical Team. The forecast predicts that ocean abundance this year of adult Columbia River "early" and "late" run coho salmon totals about 501,100 fish, which would be a considerable increase from last year's estimate of actual

abundance – which is calculated postseason -- of 170,300 fish. The ocean abundance forecasts assume certain levels of ocean harvest. Forecasts for last summer coho returns to the Columbia River mouth will be produced later.

The forecast includes an estimated 331,600 early run fish, and 169,500 late run fish.

Columbia River ocean abundance varies greatly from year to year, with nearly 1.4 million estimated in 2001 and more than 1 million in 2009, according to Pacific Fisheries Management Council data tables. But 1996-1998 saw abundance at less than 200,000 annually.

Lower Columbia River coho return primarily to Oregon and Washington hatcheries downstream from Bonneville Dam, although substantial hatchery production now occurs above Bonneville Dam. Annual coho hatchery releases averaged 23 million smolts during 2000-2009, with 38 percent of the releases occurring upstream of Bonneville Dam. Early stock coho enter the Columbia River from mid-August to early October with peak entry occurring in early September. In the ocean, early stock coho tend to remain near the Oregon and southern Washington coasts and most migrate southward from the Columbia River and are therefore referred to as Type S.

Adult returns of Columbia River early stock coho to the mouth of the river have averaged 256,400 in the 1980s, 146,300 in the 1990s and 358,400 in the 2000s.

Late stock coho enter the Columbia River from mid-September through December with peak entry occurring in mid-October. In the ocean, late stock coho tend to migrate northward from the Columbia River along the Washington coast and Vancouver Island, and are therefore referred to as Type N.

Adult returns of Columbia River late stock coho have averaged 250,900 in the 1980s, 96,800 in the 1990s and 198,000 in the 2000s.

Columbia Basin Bulletin, 2/8/2013

Affordable streamside improvements, a win-win for everyone

Farmers and ranchers value clean water and healthy natural resources but may think they can't afford to improve their streamside areas in order to help protect Oregon's water quality. However, improving streamside vegetation (aka riparian vegetation) can be simple, inexpensive, and only take a little bit of land.

Healthy streamsides are an important part of achieving the clean water that supports Oregon's diverse agricultural production and other natural resource uses. Oregon law requires farmers and ranchers to allow streamside vegetation to establish to help provide clean water.

Some streamside areas can be improved by pulling back cropping or changing grazing management in order to let vegetation establish naturally. These "passive" approaches to restoration can be a relatively quick and cost-effective way to restore a streamside area.

Many producers have improved the streamside areas on their own, but technical and financial help is available. The local Soil and Water Conservation District (SWCD), Watershed Council, or OSU Extension agent can provide assistance developing and implementing a plan. Financial assistance, cost-share, and grants are available through a variety of programs to help make these plans become a reality. The Oregon Watershed Enhancement Board (OWEB) is a state agency that offers a variety of grant programs to help Oregonians take care of local streams, rivers, wetlands, and natural areas. Improving streamsides can also be a relatively feasible way to address problems that can be costly for farmers. "By making improvements to your streamside areas, farmers and ranchers could protect water quality by stabilizing the streambank, filtering nutrients and pollution, trapping sediment, and slowing the heating of stream water," says Ken Diebel, CREP technician with the Baker SWCD.

"In addition to protecting water quality, high quality streamside areas protect valuable farmland by preventing erosion. "Still not convinced to take the first step toward improving your streamside area? All the potential benefits can outweigh the cost. Diebel points out that streamside areas can provide high quality forage. So with proper grazing management, livestock producers can improve animal health and weight gain.

"OSU ag economists have found that cross fencing to facilitate rotational grazing, providing off-stream water, strategic placement of salt, and herding to benefit streamside areas can pay for themselves because calves gain more weight and cows are healthier and easier to take care of during the winter months," he explained.

Amanda Garzio-Hadzick, The Agriculture Quarterly

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