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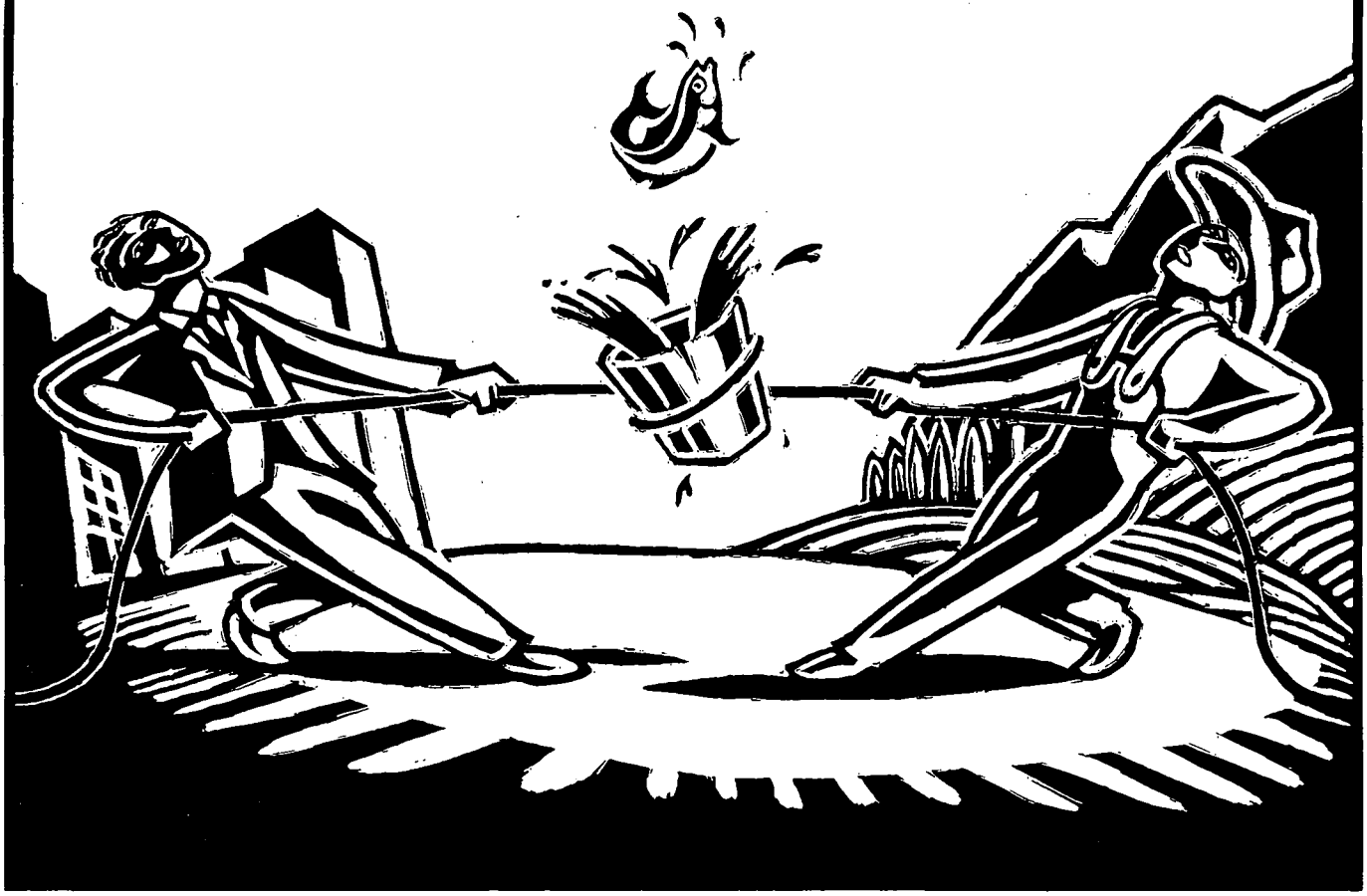

EXTENSION MISCELLANEOUS 8528
OREGON STATE UNIVERSITY EXTENSION SERVICE
OCTOBER 1992

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Introduction

Ron Miner
Professor, Bioresource Engineering, Oregon State University

Water policy in Oregon has reached a critical stage because beneficial uses of water have outgrown the supply. In the past forty years, both economic and population development have been closely related to the availability and allocation of water. Similarly, the social or economic future of Oregon will be related to how water is managed.

Most likely, current water policy decisions will have profound effects on the future of the state and region because a growing number of diverse interests recognize the importance of water policy as it affects their particular concern. The competing users are questioning Oregon's system of allocating water and method of providing a process for changes in how water is made available.

Agriculturalists want adequate quantities of water available for an abundant crop. Fishing enthusiasts and boaters desire an adequate flow of water for recreational use. Individual cities see their water supply as the highest priority. Environmentalists argue that protecting endangered species is the most important use of water.

Each spring the Water Resources Research Institute (WRRI) at Oregon State University sponsors a seminar on water-related topics. In spring 1992, WRRI sponsored "Oregon Water Policy Issues" for students and faculty at OSU in Corvallis. Faculty and students at the University of Oregon in Eugene participated in the seminar through videotape.

Each seminar was summarized by Heidi Van Zee, a graduate student in Scientific and Technical Communication, Oregon State University. This publication is the product of her graduate project. It is published and distributed by the OSU Extension Service to provide educational information on current issues of interest to Oregon citizens.

The Oregon Water Policy Agenda—Outlining the Priorities

William H. Young
Director, Oregon Water Resources Department

Water is and has been a central factor in the development of Oregon. Early farmers, ranchers, loggers, gold miners and industrialists were all guided by the availability of a reliable water supply. Managing water, allocating its beneficial and often conflicting uses, is an even more central issue today. As the first speaker in the seminar series on Oregon water policy, William H. Young discussed present water policies and the direction future water policies may take. He began by explaining some basics of western water law and the doctrine of prior appropriation.

"First in Time, First in Right"

In the west, on this side of the Mississippi River, the country is arid, streams are not well-distributed across the landscape, rainfall is not uniform, and desired uses for water are often in places that water simply isn't available. If a person wanted to develop a mining operation, agriculture, or other uses for water, it was necessary to move it from the nearest stream to the place of use. Moving water required investment, and those investments needed protection. According to the state and the law, if water is used for a beneficial purpose, without waste, and without interruption, the right to its use will be protected. A person who begins using water from the same stream at a later date will also be protected, but will have a junior water right. Even landowners with property adjacent to a stream must have a water right to use the water flowing past their property. Hence, the doctrine of prior appropriation, or, "first in time, first in right."

Riparian Water Rights and Reasonable Use

In contrast, water use in the eastern part of the U.S. is governed by riparian water rights. There, if a person owns property next to a stream, the water in that stream is available for personal use as long as that use does not "unduly interfere" with the rights of other riparian users.

Young explained one of the differences between riparian rights and prior appropriation: "If it's a dry water-year, like this year is in Oregon, under riparian law, users are expected to 'share' the shortfall, to cut back their use, so no 'unreasonable interference' occurs to another riparian user. Prior appropriation treats shortages in a completely different way. A senior appropriator, the one with the oldest right to use water, has rights to the full allocation of water before a junior appropriator will get any."

Under the doctrine of prior appropriation, the date of initial use is everything. "Admittedly," said Young, "that has been softened in Oregon and other western states. Nonetheless, it is the fundamental notion of prior appropriation." Beginning in 1909, Oregon required that a potential water user go to the appropriate state agency and file for approval to develop, or appropriate, water.

This filing system ensured and enforced water rights. One important difference between prior appropriation and riparianism: water in the west is managed as a public resource that passes into private hands. In the east, water is a public resource and remains so. "What we've created, which is a contrast between water law and almost any other natural resource law, is something almost like a property right," said Young.

Pressures, Perceptions, and Growing Populations

Oregon's water supply faces pressures from increasing municipal demands for water, a growing desire to see increased instream flows, and a continuing need for agricultural irrigation water.

One of the common perceptions about Oregon, especially west of the Cascades, is that there's plenty of water. Accompanying this is the view that if surface water isn't available for some reason, we can always turn to groundwater, which is thought to be pure and plentiful. Increasingly, these perceptions are turning out to be less than accurate, and when combined with competing uses for water, shortages can occur.

Even on the coast of Oregon, where annual rainfall can be 80 inches, shortages exist. On the Siletz River there is not enough flow to honor both the minimum instream flow requirements for fisheries and the needs of the Seal Rock Water District. The Oregon Water Resources Department is trying to determine, through the legal system, the quantity of water Seal Rock can appropriate. "Water for human consumption, by anybody's standards, is a high-value, important use," said Young. The minimum streamflow right, however, is older than Seal Rock Water District's rights to the Siletz River. Under prior appropriation, the senior date will prevail.

Portland provides another example of pressure on the state's water supply, in this instance from a growing population. The Bull Run watershed east of Portland provides water to nearly half the state's population. Bull Run is a large, well-protected watershed, providing high-quality water, so far without the need for filtering treatment. Because of the increasing population, however, the city faces the likelihood of needing more water, but has not yet located an additional source.

Historically, cities have represented only a small part of the total water diversions in Oregon, but their growth is placing increasing pressure on the supply.

The Value of Free-flowing Streams

In addition to the growing needs of cities, there is an increasing demand to leave water in streams for some purposes that we all value. Since 1987, according to Young, it has been possible for the Department of Fish and Wildlife, the Department of Parks, and the Department of Environmental Quality to apply for instream water rights, thus creating a protectable way of leaving water in a stream. Fisheries protection, wildlife habitat, water quality preservation, and recreation are examples of instream uses.

One of the main problems with instream, or minimum flow rights is the junior date of appropriation—most water rights are senior to them. Thus, there is little assurance of instream flow protection, particularly in dry years.

At the federal and state levels, legislation has been passed, creating many miles of both federal and state scenic waterways. Some requirements, limitations, and uncertainties were also created with this designation: "On federally-designated wild and scenic rivers, we don't yet know what the nature of water rights, if any, might be."

For state-designated scenic waterways, the Oregon Supreme Court has ruled the "highest and best use" of such water is to satisfy the purposes of the scenic waterway. Young also said that, according to a recent survey, the majority of people in Oregon think we ought to protect—indeed, overprotect, fish and wildlife, even if the human effects of that protection are currently unknown.

Said Young: "That's a fairly strong statement of how the public feels about this issue."

In addition to the growing needs of municipalities and the desire to increase minimum instream flows, the need for agricultural water is also increasing. "One might suppose that since agriculture is such a well-established use, surely everyone has as much water as they want. However, it's not that way at all." The south coast of Oregon, for instance, produces one of Oregon's many speciality crops, a premium cranberry. There is demand for more; the limiting factor is water availability.

The Role of the Federal Government

"Historically," said Young, "the federal government has been the 'deep pockets' participant in water development, funding large reclamation projects to 'make the desert bloom.'" Currently, the federal government is completing the last of its large projects, the Central Arizona Project and the Central Utah Project: their role in water development is changing, shrinking. "It no longer has the classic role states assigned, which was 'get out and send money.'" Still, Oregon water rights are affected by federally-reserved water rights, The Federal Energy Regulatory Commission (FERC), and the Endangered Species Act.

Old Decisions, Recent Impacts

Federally-reserved water rights exist on federal lands such as national forests and Indian reservations. Since the purpose of reserving land for Indians was to turn historically nomadic cultures into agrarians, the U.S. Supreme Court ruled in 1908 that reserved water rights existed for Indian reservations, in quantities sufficient to irrigate crops.

The Supreme Court decision is important because it determined the priority date of water rights on Indian reservations was the date the reservation was established. "On the Klamath, where we're currently adjudicating water, one date goes back into the 1860s," said Young. And once the quantity of water is established for the Warm Springs Indian reservation, the date will be either 1858 or 1864. Says Young, "These are big chunks of water." Hunting and fishing rights, rights the Indians kept, were more recently judged to date from "time immemorial."

Hydroelectric Power Regulators

"Another role of the federal government, and in some ways an increasingly contentious one, is the role of the Federal Energy Regulatory Commission, or FERC," said Young. Because FERC is directly involved with the development of hydroelectric power generation, Oregon and other states that generate such power are directly affected by this federal agency.

One Specie at a Time

Salmon and owls have been in the news for a while now, their status and management hotly debated topics. "As far as threatened and endangered species are concerned, this is only the beginning," warned Young. "We've got to start talking about the protection of ecosystems, or we're going to go through these debates specie by specie." Young said he believes both Congress and the public feel the basic policy enunciated by the Endangered Species Act is a sound one. He added that our activities should not hasten the demise of other species that share the earth, and we must make the case that it will be less expensive to spend now than later.

The Endangered Species Act affects us as soon as there is a discussion about a particular species. Any decisions we make involving that species may have long term, even irreversible, impacts. "This," said Young, "is one federal role in which the results are 'instant,' in comparison to the protracted time frames required for other projects, such as dams."

Another issue the federal government is taking an interest in is wetlands. A presidential statement decrees "no net loss of wetlands." One emerging problem is that wetlands now exist in areas they never have before, where irrigation is inefficient or poorly operated. Used irrigation water simply runs to the nearest low spot and collects. The result: a created wetland, used by many animals and supporting a variety of plants. If we begin irrigation conservation measures, those irrigation-created wetlands dry up. How do we manage this situation? What kinds of policies should we use?

What's in Store for the Future

Several areas of water management need improvement. Enforcing complaints, Young said, has been the standard for many years, but it alone will not improve our management of the water supply system. We also need better data about water supply, and better data about water use: there is presently no system for reporting use levels. Who's going to pay—who should pay, for better data?

"Our policies in this area are affected by who or what we subsidize. Subsidies, in their classic sense, are a statement, or grant, typically from the government, to a private enterprise because we want to encourage a certain practice." What policies do we encourage by a particular subsidy?

On the Columbia River, for example, we've been subsidizing our power costs with fish, though this is now changing. "Another type of subsidy is, to some extent, being demanded of unborn generations, as in the case of streams that are now less capable of their natural ability to store and recharge groundwater than they were even a generation ago." We've chosen to underwrite certain policies by our subsidies, but we must evaluate and re-evaluate the subsidies—where are they taking us? A different set of subsidies might include tax subsidies for pollution control or subsidies for stream restoration.

Young urges the evolution, not the devolution, of the system: Prior appropriation needs to be modified to meet current needs. These modifications affect our ability to manage water. For instance, we can now appropriate water for instream purposes and encourage reuse. Other changes will follow. Young maintains "We need to nudge the process of change along, so we can improve water use."

Conservation as Policy—How to Make More Water

Douglas Parrow
Conservation Program Manager, Oregon Water Resources Department

Conservation as Rerouting

Conservation can't make more water, but it can allow water to be rerouted so it's available for other uses. For example, reducing the losses from a ditch or a pipe will reduce the amount of water that must be diverted, and this will improve streamflows immediately below the diversion. In many places, keeping water in the stream instead of routing it through a ditch or pipe will provide important benefits for other users, including fish and recreation.

However, the losses from a ditch or pipe probably were eventually returning downstream; fewer losses will result in reduced return flows and generally will not have a significant effect on flow from the basin.

While conservation generally does not alter the total amount of water available in the basin, there are many other reasons to use water efficiently. Water supplies are limited and new storage facilities are expensive.

Conservation can postpone the need to construct a new water supply facility. In addition, municipal water treatment costs are increasing, and will continue to increase with new safe drinking water requirements. As the cost of treated water increases, reducing losses has become more important. Municipal customers can control their costs by using water wisely, by decreasing the sizes of their lawns, and by planting fewer water-loving landscapes.

Conservation also can reduce water quality problems. Return flows from irrigation, particularly surface return flows, may be contaminated by fertilizers or pesticides and may be warmer than the stream. Surface return flows can be controlled through better irrigation water management.

Conservation and Water Law

For years, the philosophy among water users has been that the government can't regulate the way water is used, and thus appropriators have controlled how much went where. The Oregon Water Resources Department (WRD) took exception to that view and in 1990 began a conservation policy that asserts some control over how water is used. Though recognizing the state can't deprive someone the right to use water, Parrow says it can put requirements and conditions on water use. Oregon can't deny irrigators use of their allocated water, for example, but in the future, it can insist they use the most efficient means to apply water, even if that requires using sprinklers or drip irrigation. In this way, conservation makes more water.

Oregon's Water Conservation Policy has five basic principles:

- Every water user is responsible for preventing waste.
- Water users in each river subbasin are encouraged to work together to develop water conservation plans.
- Better water use data are essential.
- Public education and conservation project funding are needed.
- Large users and suppliers must prepare water management plans.

The WRD sees several reasons for such a policy. Municipal needs are increasing, and recreation is becoming more important as people want to get away from urban centers for leisure time. One other reason: "Fish populations are in trouble," asserts Parrow. "We want to reverse these losses."

Conservation is but one of the tools available to us, but it will forestall curtailing water use and building new storage facilities. Historically, when more water was required, cities applied for another water right, but Parrow cautions that Oregon is rapidly approaching the point where that will no longer be possible. Conservation will be a cost-effective source of "new" water for municipalities.

The centerpiece of the water conservation policy is the water management plan, required of all large water users, including municipal water suppliers. The plans have three major components: conservation, curtailment, and long-range supply.

Requiring water management plans is more equitable than setting efficiency levels, as the WRD had originally discussed. One reason is that some agricultural users are already more efficient than others. For instance, irrigators in the Umatilla Basin, because of pumping costs, use water more judiciously than in the Deschutes area, where thousands of acre-feet of water per year are lost in unlined canals—50 to 65 percent of the water withdrawn. (An acre-foot equals 325,851 gallons of water.) Setting efficiency standards would do little to further increase water-use efficiency for appropriators in the Umatilla region. Those same standards, applied to the Deschutes area, may be prohibitively expensive or impossible to attain.

The conservation component requires each municipal water supplier to evaluate and calculate losses within their distribution system. Municipalities are to determine the most cost-effective alternatives to reduce system losses, and begin using those alternatives.

Because cities will soon no longer be able to simply file for additional water-use permits, the plan requires cities to decide how they will meet future demands. Since cities have water rights like any other user, they are subject to the seniority system of prior appropriation. If water becomes severely limited, cities may be faced with reduced allocations if their rights are junior to other appropriators. The plans will also require cities to identify how they will continue to supply water in case their allocation is curtailed.

Dams are expensive, take years to build, and have been unpopular in recent years. For these reasons, water suppliers must develop long-range plans that look 20–40 years into the future. If building water storage will be necessary, it can be incorporated in the long-range plans.

Agriculture, which uses about 85 percent of the water withdrawn in Oregon, can also benefit from conservation. In the Umatilla Basin, for example, some wells are over 1,000 feet deep, and pumping costs are high. Using less means pumping less. Sprinklers use water more efficiently than flood or furrow irrigation, so less water goes further.

Oregon's 1987 Water Conservation Law

The doctrine of prior appropriation requires, but provides no incentive for water conservation. If a water user doesn't divert and use the entire allocated amount, the popular misconception is that rights to the unused portion of water may be lost. In addition, there is no economic benefit to reducing water use in most gravity systems.

Under state water law, a water right applies to a specific area. Even if an irrigator can reduce the amount of water needed for that area, the unused water right stays instream, and can't be used to irrigate more acreage. Parrow says, though, the WRD has never cancelled water rights because someone saved water. Rights have only been cancelled for non-beneficial use. Non-use of a water right can also result in cancellation but only after five consecutive years.

The law passed in 1987 encourages water users to conserve by allowing them to take the unused portion of a water right and put it

on additional land. The compromise reached between the state and water users allows 25 percent of this saved water to remain instream, held by the WRD for the state. The remaining 75 percent will be available to the owner of the water right for use on the land.

For this system to work, conserved water can only be water that would otherwise be "irretrievably lost." If it is not defined that way, the potential exists to harm third parties. For instance, if an upstream irrigator conserves water, thus reducing the runoff, that saved water is not considered irretrievable, and is not available for new uses.

Unfortunately, though the mechanism for improved and reduced use of irrigation water is in place, the 1987 law provides little economic incentive for conserving water. The only "incentive" seems to be a regulatory one—either conserve water, or don't irrigate. "This isn't a very attractive option," admits Parrow. There has to be a way to pay for conservation projects. If, for example, we can line canals in the Deschutes area, substantial water will be saved. The WRD is working to develop economic incentives for water conservation in the agricultural sector.

Results of Water Conservation

Water conservation is less expensive than any other alternative answer, short- or long-term. Conserving water will make public supplies less expensive. New water storage projects may not have to be built. With the passage of the federal Clean Drinking Water Act, costs of treating water have risen dramatically. If less water requires treatment, costs will be lower. Municipalities are finding treated water is too expensive to waste. And most municipal water suppliers are not concerned about having to prepare water management plans—they view the plans as consistent with their own goals.

A second result of water conservation: local streamflows are likely to improve from reduced diversions. There will be reduced flows from some basins, however, since there will be less irrigation return flow. But reduced return flows from agricultural irrigation will reduce pollutant levels and improve water quality.

There are, however, some tradeoffs in water conservation: If we improve leaking, inefficient irrigation systems to put more water back into streams, irrigation-created wetlands will dry up.

Reclamation, Clamation, and Declamation

Bringing land into agricultural production was "clamation;" nothing was re-claimed. Parrow refers to the process of taking agricultural land out of production as "declamation." In Nevada, for example, conserving water on irrigated lands began to dry up wetlands, and to restore those wetlands, the Bureau of Reclamation bought water rights. "If we're serious about restoring streamflows, maybe we ought to start talking about declamation." Conservation is rerouting, changing the place and purpose of water use. All of us, as water users, are part of that rerouting.

Oregon Water Law—What it is, How did it Evolve, and What does it do?

Stephen Sanders
Assistant Attorney General for Water Resources and Agriculture, Oregon

There are two water users in competition in the Klamath River Basin: one demands water in Klamath Lake, and the other depends on water in the river. In this dry water-year, neither the endangered short-nosed sucker of Klamath Lake nor the Klamath River salmon is likely to have enough.

Water, a resource we once thought to be plentiful, is not—its limited availability will restrict further growth in Oregon. As Stephen Sanders pointed out, shortages are only one of the issues we're facing today. Other issues: The doctrine of public trust is becoming more important. Legalities and restrictions surrounding threatened and endangered species are only beginning to be felt.

Public Trust—A 1940 water right owned by the City of Los Angeles was prohibited from interfering with a public good, in this case, Mono Lake. The court decided the state's public trust duty was to protect "common heritage resources" like Mono Lake. Depending on its interpretation elsewhere, fisheries, wildlife habitat, and other public goods may be subject to this doctrine.

Endangered Species—According to Sanders, the Endangered Species Act "may well emerge as the greatest issue in water law in the 1990s." Under the act, endangered species may not be "taken": harassed, bothered, maimed, killed, or lose habitat. What happens, then, to the holder of a water right whose irrigation withdrawals result in "taking" endangered species? For now, it is unclear. It *is* clear is that the Endangered Species Act has far-reaching implications.

Water Availability—"It is now apparent that water availability is going to be one of the big restrictions of growth for Oregon," maintains Sanders. Growing cities and industries, for example, are finding there simply is no more water. One issue yet to be resolved is determining which uses are preferred, have the highest value. The Water Resources Commission will decide, and of the water left to be appropriated, which new uses will be permitted. These issues are coming to the forefront of water resource policy, in part, because the doctrine of prior appropriation is no longer well-suited to our needs. Why? It may help to understand what prior appropriation *does* to better understand what it does not do.

The Evolution of Prior Appropriation

In contrast to riparianism, the water allocation doctrine of the eastern U.S., which is based on the premise there's enough water to go around, prior appropriation came about to serve the needs of an arid west, primarily placer miners and irrigators. It was designed to create certainty, a reliable source of water for those who needed it, when they needed it. An irrigator, for example, needed to know that enough water would be available throughout the growing season to bring a crop to maturity. If an irrigator was expected to share in a shortfall, as riparianism dictated, crops would die from a lack of water.

Said Sanders, "Under prior appropriation, whoever got to the water first got it all. That settled the question." It didn't. The only way to settle the constant disputes that arose over water was to go to court. Cases were sometimes decided according to "local custom," and a case between two parties did not necessarily apply to any other disputes.

This lack of precedents and years of nebulous definitions led the State of Oregon to enact a set of administrative water laws in 1909. The state's involvement was to hold and issue all records of water rights and to act as the final authority. Another reason the state became involved in regulating water rights stemmed from the realization that eventually, there would not be enough water for every use; some would be preferable to others.

Creating a Water Right

After 1909, a water right, with several exceptions, could only be created by filing with the Water Resources Department (WRD). Groundwater became subject to water rights in 1955, though groundwater used for domestic purposes is still exempt. Water from a spring or seep, provided it is entirely on the property of the user, can be used without a water right. However, if a spring forms on one piece of property but flows onto property owned by someone else, that spring is subject to appropriation, and a water right must be obtained.

What is a Water Right?

A water right is comprised of eight characteristics that specify use limits. A water right permits "beneficial use" of water. Before instream water rights became a beneficial use in 1955, any water to be put to use had to be appropriated, taken from the stream. Fresh water flowing to the ocean was considered "wasted." "To my knowledge, there has never been a proposed use that was not determined to be beneficial," said Sanders. Recently, a farmer wanted to flood his field to wash accumulated boron from the plants' root zones; that was determined a beneficial use. Another characteristic of a water right is that it is a "usufructuary" right: a person holding a water right can *use* that water but does not own it. Each water right is limited to one use: a person who wants to appropriate water for hydroelectric power generation and irrigation, for example, must apply for two water rights.

The "rate" of a water right is the volume of water per unit of time that can be diverted. For irrigation, this volume is typically 1/40 cubic feet per second (cfs) per acre. Even if an irrigator has a total right to 4 acre-feet of water, it can only be withdrawn at the rate specified on the water right. This is to allow more people to use water and not dry up a stream.

"Duty" is the total volume of water allowed to be diverted under the water right. For irrigation, this is measured in acre-feet, or the amount of water required to flood one acre of land one foot deep (325,851 gallons). In Oregon, duty averages from 3 to 4.5 acre-feet; however, some older water rights have duties up to 10 acre-feet.

Where will this water be applied? Within city limits, or on a pasture? The place of use is specified on the water right, and cannot be changed without applying for a transfer. Instream water rights apply to a stretch of river protected by the right.

The water right also specifies the point of diversion, and except to follow a change in the course of a river, such as a meander, it cannot be changed. Lastly, the season of use is specified. For municipalities, it's year around; for irrigators, it's typically from May to October.

Transferring a Water Right

Once a water right is "vested," that is, a certificate of use has been issued by WRD, it can be transferred, though there are some limitations. Neither the season, the rate, nor the duty can be changed through transfer, but the diversion point, the purpose, and the place of use can be. For instance, if an

irrigator chooses to sell a water right through transfer, the Oregon Department of Fish and Wildlife or a special-interest group could buy it, and gain protection for fish and wildlife. The seniority date of the transferred water right is retained.

The Future of Prior Appropriation

Prior appropriation didn't consider what was morally right, economically feasible, ecologically conscious, or equitable. Oregon is facing these shortcomings now, and there are no easy answers. There are more uses and concerns today than prior appropriation was designed to consider. What do we do now?

Sanders discussed water marketing as one alternative that, while not a complete answer, may help to modify prior appropriation, to strike a balance between preferred uses and senior water right holders that will more closely fit our needs today. The theory behind marketing is that high-value uses such as domestic and municipal water use are willing to pay for senior rights, rights predominantly held by irrigators. For example, much of eastern Oregon is planted in alfalfa or as pasture—low-value crops, but at the right price, irrigators may be willing to sell water rights to growing cities, or to groups such as the Nature Conservancy, for instream flow protection. Water marketing is seen as a way to re-allocate water among uses, to make it flow toward money, to more closely equal its market value instead of its economic value.

A growing number of people are questioning whether we should have spent so much money on irrigated agriculture, something that produces so little economic return. However, it's not clear that we can shift uses without incurring more costs. "Marketing water from low- to high-value uses is a contentious issue," cautioned Sanders. "Irrigation is considered a great social good." If water use does shift to high-value uses, what happens to the farmers? Land values will fall, and so will the tax base. Some worry that the social fabric of rural Oregon will be destroyed.

Irrigators, who use most of the water in Oregon and the west, are beginning to address these questions. They may be forced to share part of their water rights with legislated competitors like the short-nosed sucker. Or, they may sell their senior water rights to thirsty cities willing to pay for an assured water supply. The balance of use is shifting, but as Sanders pointed out, none of this will be without controversy.

Water for Instream Uses—How Much do We Need?

Jill Zarnowitz
Acting Assistant Director, Habitat Conservation Division, Oregon Department of Fish and Wildlife

Sportfishing in Oregon is more than just tourists with fishing poles. It generates over $1 billion annually in business profits and salaries for the state. In 1990, the Oregon Department of Fish and Wildlife (ODFW) received $11.3 million in license fees from anglers. This is a significant contribution to Oregon's economy, and provides a partial incentive to keep fish in streams and their populations healthy.

Another part of the incentive is more difficult to quantify, but equally important. Fish belong in streams because they are part of the whole, the ecosystem in which we live. Lastly, the specter of extinction looms: a Northwest with no salmon for future generations is unthinkable to many people. The intrinsic value of fish and healthy fisheries extends to less economically-important species as well, added Jill Zarnowitz. Both salmonids, which include salmon and steelhead, and non-salmonids deserve clean and healthy habitats.

People and People, not Fish and People

Zarnowitz doesn't see instream flow protection as an issue between fish and people, but rather between people. People make choices and assess priorities. If fish are not among those choices, reduced populations from habitat degradation, a shorter fishing season, and a loss of jobs and revenue could be the results.

It is people that want to keep fish around and people who will lose jobs, revenue, and a way of life if fish cannot survive. People will also lose the health of their environment.

Though healthy fish populations have been reduced because of competing uses for water, particularly from irrigation, Zarnowitz said "I want to make it clear there is no maliciousness on the part of farmers." Irrigators and other early water users were following society's expectations of settlement, food production, and rural electrification. Protecting fish populations was not part of that equation; people didn't realize the long-term effects their activities would have on fish.

How Much is Enough?

The time has come, however, to mitigate some of these losses. While Zarnowitz concedes it is probably impossible to restore fish populations to historic levels, they can be improved. One of the first steps is to determine how much water fish need. The ODFW estimates this amount by determining how deep instream water must be for each specie and how much flow is required to enable fish to complete the stages of their life cycles: passage and migration; spawning, fry development and egg incubation; and rearing. Chinook salmon, for example, can use a maximum stream velocity of 8 feet per second and need a minimum depth of 0.8 feet for passage. A velocity of 1–3 feet per second is required for spawning.

When ODFW has determined the necessary water requirement for fish in a stream, the allocation request goes to the Oregon Water Resources Department (WRD). One difficulty, said Zarnowitz, is that the average streamflows established by the WRD don't coincide with seasonal requests from ODFW.

Streamflows for fish have variations above and below the WRD average, depending on the stage of their life cycle.

Fish may need high flow events to trigger migration or overcome obstacles; the average flow does not reflect these periodic spikes in the flows. Salmon need higher streamflows in April and May to insure downstream migration, but less in late summer for rearing juvenile fish. The WRD and ODFW set instream flows based on compromises between the two levels.

Other components of fish habitat are important as well. Fish must have clean water, water almost as clean as drinking water, says Zarnowitz. It has to be cold—less than 62°F. Some species, like bull trout, prefer water temperatures near 48°F. Unfortunately, allocating water for instream use is not as straightforward as requesting and getting a water right from the WRD.

There is little water in Oregon that is not already allocated, at least during the summer and fall, said Zarnowitz, and the WRD must determine who will get what's left. "Ultimately, there will not be enough water to supply every desired use." Quantities of water requested by ODFW for instream flows are not always there. Many streams have no water available for allocation, or, if they do, the available amount is sometimes insufficient to protect fish. Second, if the ODFW does get an instream water right, it may only be a "paper right," existing on paper but not as water actually in the stream.

This is generally because the ODFW has appropriation dates that are junior, in some cases, to other water users on that stream. Additionally, surface water has been diverted by land-based activities for so many years there is little resiliency in many stream systems.

Because several different species of fish with different needs frequently inhabit the same stream, it is increasingly difficult to provide for those needs with the available water.

Healthy Streams for Fish—Habitat Restoration

It will take more than adequate streamflows to protect fish populations, warned Zarnowitz. Other habitat components must also be present: ripple and pool areas, spawning gravel, and trees that provide water-cooling shade. Restoring damaged riparian areas can help add water to the system by reducing evaporation and holding water underground for slower release to the stream, but the healing process is slow.

The 1987 law that includes instream uses as beneficial may help to improve fish populations and habitat. Zarnowitz affirmed the ODFW has no formal program to buy senior water rights, but says groups like the Nature Conservancy are taking advantage of the opportunity created by the 1987 law and have bought land with senior water which can then be converted to instream water rights.

Water use has been land-based, or out of stream, for so long, there's a fear among present water users that instream uses will negatively affect them. "The ODFW's water rights are so junior in most cases, only future users will be affected," said Zarnowitz. In establishing stream flows to maintain fish populations, we are essentially determining how much water it's going to take to keep hotels, restaurants, gas stations, and grocery stores open for anglers and others who use rivers for instream recreation. Instream water is water for people as well as fish, an economic use of a resource as well as an intrinsic one. Both are important for different reasons, but we must decide that both are equally important while we still can. "Our choices determine what kind of future we want to have."

Alternatives for Future Water Policy—What Policies Should We Consider, Which Should We Adopt

James Huffman
Northwestern School of Law, Lewis and Clark College

The water will cost about $2,000 per acre-foot (325,851 gallons), but the desalting plant in Santa Barbara, California should provide sufficient municipal water to the area when it is completed. At the same time, in other parts of California, agricultural users buy federally subsidized water from the Bureau of Reclamation for as little as $5.00 per acre-foot. Most cities will not have the option for desalting water—they are too far from the ocean and the technology is relatively new, energy intensive, and prohibitively expensive. However, as cities in the west continue to grow, they are faced with finding additional supplies of water. One frequently mentioned source is agriculture, since that sector has by far the largest share of water in the west.

Santa Barbara is an extreme example, but it represents one of the disparities in water allocation James Huffman predicts will change. Populations are growing, and more people want to see water remain in streams for recreational uses as well as for fish and wildlife. The available water can't supply all the competing uses. In the future, said Huffman, we'll have to learn how to move or transfer water from one place to another, from one use to another. Second, we have to make more efficient use of the water we're now using. Among other benefits, this will help limit the amount of water transferred, and thus the costs associated with transfer. Lastly, we must account for what economists refer to as "external costs." When pollutants are discharged into a river, for example, society pays the cost. External costs need to be internalized—that is, the polluter pays.

Moving water to other uses, using it more efficiently, and avoiding external costs may seem limited or simplistic. However, our legal system has already used these approaches, and continued use seems logical, since innovations in the law are unlikely.

Three Policy Approaches to Efficient Water Use

One approach to using water more efficiently is a market system, which would allocate water based on the willingness to pay for it. A second is continuing to regulate the current private rights system toward the goals society wants to achieve. Third, water can be managed by the public through government. In all probability, said Huffman, more efficient water management policies will be a mix of these three approaches.

English Water Policies Migrate Westward

As Huffman pointed out, our current water policies are the legacy of an entrenched system of water rights.

Miners and settlers, new to the west, brought laws from the east. In addition to riparianism, the English concepts of navigational servitude and the public trust doctrine also immigrated west. Riparianism quickly gave way to appropriation, a concept more suitable to the new, arid environment to which settlers came. Appropriation was a system of essentially private water rights

regulated by individual states. In contrast, navigational servitude and the doctrine of public trust were public rights.

Navigational Servitude

Under navigational servitude, the federal government was obliged to keep navigable rivers navigable. This has less significance today, especially in the west, but in the past, before railroads criss-crossed the nation, navigable rivers were important routes of commerce. Huffman gave an example of how navigational servitude applies. "If I had a water right on the Willamette River, and my appropriations rendered the river too low for navigation, the federal government could shut off my water right, even if it's an old one, because navigational servitude dates from time immemorial."

Public Trust—An Old Doctrine Revived

The doctrine of public trust was also born in England. Unlike navigational servitude, its public benefit concepts have been applied more broadly and more recently. Under public trust, states own title to river beds that underlie navigable waters. This land, however, can't be transferred unless it promotes the public interest.

Huffman cited the case of Illinois Central Railroad as an example. In 1872, the State of Illinois granted the railroad title to virtually all the Chicago waterfront. Four years later, the state passed a law taking back that land. Understandably, Illinois Central took exception to the new law and in 1892 the U.S. Supreme Court heard the case. Huffman said there are two interpretations of the court's ruling. The first is that because of the public trust doctrine, the Illinois legislature could not give away the land in the first place. The other is that, yes, Illinois could give the land away, but they could also take it back, because of the public trust doctrine. The first interpretation has become the most widely used definition, as in the case of Mono Lake in California.

Which waters are considered navigable, and therefore subject to public trust? According to Huffman, any waters that were navigable at the time a state entered the union. In 1987, the Montana supreme court determined that not only did the public trust apply to the 2,000 miles of water that were navigable when Montana became a state, but to any water that could be used for recreation. Essentially, then, all water in Montana is subject to public trust. Depending on how each state interprets it, public trust may not necessarily be limited to navigable water.

Federally-Reserved Water Rights

A more recent public right came about in 1908, when the U.S. Supreme Court ruled that federal land reservations, specifically Indian reservations, were meant to include water rights dating from the establishment of the reservation. Reserved rights also apply to national forest and park lands, and military reservations.

Though it deferred to states in many aspects of water policy, the federal government has been active in developing hydroelectric power, a public benefit, and subsidizing agricultural production, also, at least initially, considered to be a benefit to the public. Navigational servitude, public trust, federally-reserved water rights, and federal involvement in hydroelectric power and farm subsidies will be part of the future, which is why Huffman said our approach to more efficient water use will probably combine the existing policies and institutional framework with new concepts such as water marketing.

Water Marketing as a Partial Solution

How can we make water marketing work? Huffman sees two issues that must first be resolved if marketing is to be one approach to more efficient water use. The owner of a marketable water right must realize all the benefits and costs of ownership, which means internalizing costs that may yet be external. Second, we must get rid of agricultural subsidies. It will be difficult; they have

been in place for a long time, and are a political issue, but there is no incentive to conserve water when it costs as little as $5.00 per acre-foot. To people concerned that losing subsidies would be economically catastrophic for farmers, Huffman said agricultural workers who want or need vocational retraining should have it. But, as he pointed out, many recipients of federally subsidized water are huge corporations.

Something is wrong with a system in which one sector pays $2,000 per acre-foot for water, yet another, not 300 miles away, pays as little as $5.00 for the same amount. Water marketing would establish an equitable price somewhere between $5.00 and $2,000. "Those people in Santa Barbara aren't going to be desalting water for $2,000 an acre-foot if they can buy it from farmers."

Huffman cautioned that while it's important to open the door to market forces, it's equally important not to abandon all of the institutional framework. Laws provide certainty to both old and new uses of water. An 1875 water right means an 1875 seniority date whether its owner is a farmer, a city, or someone who chooses to keep the allocated water in the stream.

Oregon Policy for Water Quality—From BAT to TMDL and Beyond, How to Implement the Clean Water Act

Fred Hansen
Director, Oregon Department of Environmental Quality

The Clean Water Act of 1972 sent a slurry of abbreviations down the pipe and into the offices of state water quality agencies charged with enforcing the act. These abbreviations have become standard usage in the effort to regulate and improve water quality in Oregon. Among them:

- **BMP** (Best Management Practices). These are designed to reduce the likelihood of pollution. For instance, providing cattle with an offstream source of drinking water, rather than requiring them to enter a stream, will reduce turbidity, sediment transport, and fecal bacteria in the water.

- **BCT** (Best Control Technology). A specific technology required for each type of industry to remove pollutants. Municipalities, for example, must apply at least secondary treatment to wastewater.

- **NPDES** (National Pollution Discharge Elimination System). A permit system, established for specific levels of pollutant discharge.

- **TMDL** (Total Maximum Daily Load). The Oregon Department of Environmental Quality (DEQ) must establish point and nonpoint TMDLs for each pollutant on every water quality-limited river, and the total allowable waste load is allocated among users. Fred Hansen cited the Tualatin River, near Portland, as an example. The total allowable phosphorus load on that river from point source users is 30 lbs per day.

Other terms commonly used in the language of water quality:

- **Waterbody**—any "body of water," including lakes, rivers, and streams.
- **Water quality-limited**—waterbodies receiving such heavy discharges of pollutants that effluent standards cannot achieve water quality standards.
- **Point source**—water pollution coming from a identifiable point such as a pipe, ditch, boat, or well.
- **Nonpoint source**—water pollution that has a diffuse origin, such as runoff from a field or forest.

The Clean Water Act established a regulatory framework to improve water quality, focusing on the source of pollutants that entered a waterbody. "Effluent discharge requirements" were established to limit the amount of pollutants a given factory, mill, or waste-water treatment plant, for example, can discharge. As recently as the 1950s, said Hansen, slaughterhouse waste would run, untreated, down the Willamette River. People would burn garbage on the riverbank in the summer and wait for the first rains to raise the river level and carry the residual away. It's difficult to imagine that now, thanks in part to the Clean Water Act.

Managing Water Pollution

Still, there are challenges. The "Elimination" in NPDES was once thought possible. "Actually, we only *manage*

pollution," said Hansen. Unfortunately, it's unrealistic to think in terms of eliminating it. According to Hansen, industries, municipalities, and regulators spend about $100 billion each year to manage all forms of pollution. Less than two percent of that is spent on pollution prevention. Pollution management takes place "at the end of the pipe, at the end of the smokestack, or after the hazardous or solid waste has been produced." As a nation, we produce increasing amounts of pollution, and control it, manage it, but typically we do not work "back up the pipe" to reduce the amount of pollution generated in the first place. Other challenges: regulatory science can't keep up with the number of chemicals being introduced, and these must be identified before we can regulate them.

Measurement techniques have improved, though. Twenty-five years ago, water pollution control dealt mainly with biological oxygen demand, and our principal concern was infection from bacteria. Little was known about toxic chemicals and heavy metals, and pollutants were measured in parts per million. Today it's parts per quadrillion. In terms of size, Hansen compared a part per quadrillion to the area covered by a postage stamp placed on the State of California. This may seem insignificant, but Hansen warns it's the toxicity level of some new chemicals that's dangerous to humans.

In the past it was thought these toxics were part of another chemical measured in parts per million, but we now know there are individual toxic chemicals measured at parts per quadrillion that pose risks to humans. The standard for dioxin, for example, is .013 parts per quadrillion in the water column.

Nonpoint Source Pollution—A Complex Cleanup Task

Setting TMDLs for nonpoint source pollution is the most complex water quality issue facing the DEQ. "Our ability to regulate theseis inadequate," stated Hansen. Measuring pollutants coming from a pipe is relatively straightforward compared to measuring nonpoint pollution, activities that take place over large areas. How can we measure pollutants from irrigated agriculture, a logging operation, or a shopping center parking lot?

If, for instance, 100 acres of alfalfa is being grown across a stream from 50 acres of wheat and both are just downstream from a logging operation, it's difficult to determine the source of a particular pollutant, such as phosphorus, much less establish and allocate a TMDL among these nonpoint users, as the Clean Water Act requires. Runoff and soil infiltration rates vary, as does the amount of fertilizer applied to a given crop. There may also be naturally-occurring sources of pollutants. In addition, the pollutant load may vary depending on the time of year.

The DEQ is addressing these questions, but answers don't come easily and it's difficult to be certain they're correct.

Another issue related to TMDLs and nonpoint source pollution is BMPs. If the farmer growing alfalfa reduces the amount of fertilizer used, or changes irrigation techniques or tilling direction in an effort to reduce pollutant discharges into a river, how can we determine whether these practices result in less-polluted discharge? The technical framework is not in place to regulate or accurately measure the effect of BMPs.

A significant problem with TMDLs, both point and nonpoint, is that loads are established for each pollutant. A TMDL established for phosphorus may lead regulators to focus on it, with the possible consequence of overlooking the health of a waterbody as a whole.

The future will bring, Hansen predicted, a turn toward using the marketplace as an effective tool for dealing with nonpoint sources of pollution. Instead of government telling farmers and foresters, for example, what practices they must employ, government might better focus on the amount of discharge that will be permitted. It can then allow the various land managers to find the most efficient and cost-effective ways to achieve the necessary reductions.

Cross-Media Pollution

Hansen pointed out another issue he referred to as "cross-media pollution," when water pollution becomes air pollution or air pollution becomes water pollution. Water–to–air pollution results, for example, when a sewage treatment plant sends volatile organic compounds into the air from wastewater treatment. Water-to-air pollution can also occur when underground oil and gas tanks, removed because they have ruptured, are dug up along with the surrounding soil. The tank is cleaned and disposed of, and the contaminated soil is spread above ground to aerate. Air–to–water pollution can occur when water scrubbers are placed on the end of smokestacks to remove airborne particulates. Cross-media pollution is currently not subject to regulations such as exist for single-media discharges, but as we generate more pollution, it must become an area of prime focus.

How Clean is Clean?

The water quality standard the DEQ is working toward is that of the highest beneficial use, a standard Hansen calls "fishable/swimable." Hansen sees several actions, in addition to the Clean Water Act, to attain fishable/swimable water in Oregon.

First, we need to reduce the "burden of proof" that currently dictates waiting until there's a problem, proof of pollution, before clean-up can proceed, or reductions or elimination of discharges can be implemented. Second, we must focus on preventing pollution, which means working at the "front of the pipe." This is beginning to happen with some hazardous wastes—instead of trying to find a place to put them, we're deciding it's better not to produce them at all.

We have a right to a clean, healthy environment. To those who claim such an environment is at the cost of jobs, Hansen pointed out that economic development is not necessarily in conflict with the environment. Businesses, he said, look for a clean environment and a good educational system to provide a high standard of living for their employees. A clean environment is an attraction, not a deterrent, for businesses considering coming to Oregon.

The Clean Water Act isn't a perfect piece of legislation, but it has moved society forward with dramatic strides. Rivers and lakes are cleaner now than they were 20 years ago, when a river in Ohio caught fire. As with other issues of environmental concern, a holistic approach is necessary if we are to succeed in cleaning up Oregon's water. We cannot afford to look at one pollutant at a time, one water user at a time, one river segment at a time.

The Umatilla Basin Project—Water Policy in Action

Chapin Clark
Professor Emeritus, University of Oregon School of Law

After years of disputes, media attention, and five long days of negotiation, several groups including the Umatilla Indians, Stanfield and Hermiston Irrigation Districts, the Bureau of Reclamation, WaterWatch, and Oregon Trout reached an agreement allowing the Umatilla Basin Project to move forward. This is a fish enhancement project, authorized by Congress, designed to restore the once-plentiful salmon population to the Umatilla River and to the Umatilla Indians who have treaty rights to those fish.

Salmon and steelhead are virtually non-existent today: five dams on the Umatilla's 87-mile length make fish passage all but impossible. And since the Umatilla is used extensively for irrigating crops, flows drop precipitously in the late spring and summer, which adds to the problem.

Indian Treaties and Declining Salmon Stocks

According to Chapin Clark, one provision of the 1855 treaties with the Indians was that they were to retain the right to fish "at all usual and accustomed stations." This caused few problems until the turn of the century when white settlement began to compete with the Indians for land, water, and fish. After passage of the Reclamation Act in 1902, some of the Bureau of Reclamation's first projects were authorized in the Umatilla Basin of northeastern Oregon. Irrigators and settlers were the second group the federal government had promised the river to. By 1924, four irrigation districts were receiving Bureau of Reclamation water from the Umatilla River. A rural economy, dependent upon the federal irrigation projects, grew up in the Umatilla Basin. The combination of irrigated agriculture, the Bureau of Reclamation dams and other non-Indian water uses meant reduced flows for salmon and, as Clark pointed out, difficult times for the treaty rights of the Indians: salmon were central to their way of life, providing not only a food supply, but playing a part in their religion and culture. Throughout the northwest, Indian tribes were confronted with continually declining fish stocks, and by the 1970s an increasingly bitter struggle over Indian fishing rights came to a head. A 1974 decision by a federal court judge held that the "fishing in common" language of the treaties should be interpreted as the right of Indians to catch up to 50 percent of off-reservation fish. Armed with this decision, some tribes went to court to sue for compensation of their lost fisheries. The Confederated Umatilla tribes, however, tried a different approach.

A Political Solution to a Legal Problem

In the 1980s, the tribes met with representatives from the irrigation districts of the Umatilla area and together went to Congress for a political solution to their treaty-retained fishing rights. In 1988, Congress authorized the Bureau of Reclamation to build the Umatilla Basin Project so the Umatilla Indians, whose reservation is upstream from the irrigation districts, might once again be able to fish for salmon.

The project represents a new type of work for the Bureau of Reclamation. Traditionally, the Bureau has built irrigation facilities such as dams, canals, and drains, but the Umatilla

Basin Project is a fishery enhancement project—it calls for exchanging Columbia River water for the Umatilla River water allocated to irrigation, as well as installing fish ladders and bypass screens, building hatcheries, and restoring habitat. As Clark commented, the Umatilla Basin Project is a new role for the Bureau, whose stated agency mission has recently been limited to operating and maintaining its existing facilities.

Clark described the two phases of the $43 million project:

- Phase I: The West Extension Irrigation District, located along the Columbia River west of Hermiston, Oregon, will get some allocated water from the Columbia instead of Three Mile Falls Dam on the Umatilla. Phase I is already under construction.

- Phase II: Hermiston and Stanfield Irrigation Districts will receive water from the Columbia River in exchange for Umatilla water.

Hermiston Irrigation District will forgo some allocation from the Umatilla so minimum instream flows can be met to aid fish migration.

Stanfield Irrigation District, located immediately south of Hermiston Irrigation District, will also forgo diverting from the Umatilla until minimum streamflow requirements have been met. In addition, Stanfield, which has contracts for 38 percent of the storage in McKay reservoir, will forgo using approximately 25,000 acre-feet of that water. It will remain in the reservoir, a "savings account" for instream flows.

Under Phase II, construction by the Bureau of Reclamation of new diversion facilities will supply Columbia River water to Hermiston and Stanfield Irrigation Districts in lieu of Umatilla Basin water (both natural flow and McKay reservoir stored water) which will be available to support flows in aid of salmon runs.

Although complicated in its detail, the concept is to divert Columbia River water for irrigation by Hermiston and Stanfield Irrigation Districts. This will firm up supplies for these districts, in exchange for the release of some Umatilla natural flow and stored water by these districts in aid of minimum flows to support fish passage in the Umatilla River. In particular, the timed release of McKay stored water for fish passage, instead of for irrigation, is crucial for success of the project's goal of restoring salmon runs.

Indian Tribes, Irrigation Districts, Public Interest Groups, and Salmon

The project sounds straightforward and desirable. The Indian tribes want it because it's the best option available to bring fish back to the Umatilla. The Irrigation Districts want the project to work because, as Clark pointed out, the knowledge that Indian fishing rights predate their own water rights has hung like a cloud over the future of the farmers in the basin. The Bureau of Reclamation views the project as an opportunity to expand the agency's work into a new area. Fish and wildlife interests support efforts to enhance or restore fish populations, as does the Oregon Department of Fish and Wildlife. Support for the project seemed unanimous.

Then last year, WaterWatch, a public interest group that monitors the state's water policies and legislation, issued a report that was later made public by the *Oregonian* in an article titled "The Umatilla River Blues." The report stated the Westland Irrigation District had conserved substantial water from its McKay Reservoir allocation and was selling that conserved water to the Teel Irrigation District, immediately south of Westland. The report claimed Westland was prohibited from selling water outside its boundaries under its contract with the Bureau of Reclamation. As conserved water, Westland had no right to sell, and Teel had no right to buy, argued WaterWatch.

In response, Westland Irrigation District said they had incurred a debt of $800,000 for their conservation efforts, and needed some way to pay off that indebtedness. Westland also said the water they were delivering to Teel Irrigation District was under a permit issued in 1924, for 12,000 acres to be irrigated from McKay Reservoir. Since the

water was being used for that amount of acreage, they maintained their practice was within the law. The water right had, however, never been certified by the state.

WaterWatch maintained the permit issued for 12,000 acres didn't include the Teel District. Westland replied that until the state certifies the permit, there is no way of knowing *which* 12,000 acres have a water right. In addition, all four irrigation districts said the federal law that authorized the Umatilla Basin Project contemplates boundary expansion on any land that was irrigated prior to October 1, 1988. Water delivery to Teel would be legitimated if the Bureau of Reclamation would approve the requested boundary expansion and the state certified a water right from McKay Reservoir for these lands.

Westland was not part of the proposed Umatilla Basin Project, yet the concerns of WaterWatch and Oregon Trout had to be addressed. These organizations had filed a protest before the Oregon Water Resources Commission to the issuance by the state of the water permit and exchange order necessary for the Bureau of Reclamation to implement Phase II diversions from the Columbia River. Further delays and squabbling in Oregon could easily derail the funding authorization in Congress. Without a compromise, the project would go to a formal contested case hearing, and all the work to get congressional authorization could be for nothing—the Umatilla Indians may just as well have gone to court in the first place.

The Water Resources Commission authorized a mediation process involving the parties already mentioned as well as representatives from Bonneville Power Administration, Oregon Department of Fish and Wildlife, and other entities. The contested case hearing was put on hold. The mediation process was eventually successful in achieving agreement as to a stipulated permit and exchange order as well as several memoranda of agreement signed by relevant parties. The Commission issued the permit and exchange order earlier this year and funding was continued by Congress for Phase II.

Winning Support for the Umatilla Basin Project

Although it could hardly be said that all problems were resolved by the mediation process, it was successful in moving Phase II of the Project toward implementation. It was successful, according to Clark, for the basic reason that all parties wanted Phase II of the Project to proceed and most parties had something to lose if the negotiations failed and Congress declined to fund Phase II. Also, as an alternative dispute resolution process, mediation brought all relevant parties together face to face in a problem-solving context without the constraints of rules of evidence and other legal formalities.

Five days of intensive negotiations and sharing of information and positions were spread over two months, interspersed with the exchange of numerous memoranda by fax.

Numerous issues were put on the table for discussion and some dropped out as unimportant or were resolved by better information. The basic position of WaterWatch and Oregon Trout was that the state and federal water laws must be enforced if Phase II as a federal investment was to be successful in restoring salmon runs. The most difficult issue was their complaint of "water spreading"—that Westland and Stanfield Irrigation Districts were delivering water out of district, contrary to law.

As negotiations continued, the Water Resources Commission issued an Enforcement Schedule for the Umatilla Basin. The Bureau of Reclamation said in writing that the current irrigation season would be the last one in which the districts could deliver water out of district. The Water Resources Department indicated that the lands in Teel would not be certified as having a right to McKay stored water for irrigation. With these agency decisions, the issue as to Westland faded from the table, especially since Westland was not part of the Columbia water exchange Phase II of the project.

As to Hermiston and Stanfield Irrigation Districts, the project had been planned by the Bureau of Reclamation and politically supported by the irrigation districts on the

assumption that all the land irrigated prior to October 1, 1988 that were served by these districts (not just the irrigated lands within the districts) would be part of the exchange of Columbia water for Umatilla Basin water. In recognition of this, agreement was reached that a boundary expansion process would be carried through for these districts (without a guarantee as to results) and that in the interim the necessary water permits and contract amendments would be sought by the Bureau of Reclamation to allow continued water delivery by the Hermiston and Stanfield Districts to land served and irrigated prior to October 1, 1988.

The negotiations represented a new approach in resolving conflicts between what Clark referred to as older and newer values. Older values emphasized family farms and irrigated agriculture, subsidized water projects for settlers in the west as national policy, casual enforcement of water laws, and informal understandings. Newer values emphasized water conservation, instream flows for fisheries and other purposes, stricter enforcement of laws, and environmental assessments prior to government decisions.

In this case it seems clear that Congress intended the Umatilla Basin Project both to sustain the irrigated economy in the Umatilla Basin and to restore salmon runs in the Umatilla River, especially for the benefit of the Confederated Umatilla Tribes.

Perhaps unexpectedly for the parties in the basin who supported the project in Congress, the efforts of WaterWatch brought the practices of government water agencies and the irrigation districts under intense scrutiny in the clash between older and newer values.

Clark expressed the hope that although different values, perspectives and interests will remain as to use of water resources, sufficient accommodation will be achieved to benefit all water users in the basin, including the objective of restored salmon runs. The willingness of all parties to seek solutions through mediation and negotiation was a giant step forward in this direction.

Keeping Options for Future Water Uses on the Willamette—Agriculture, Recreation, and other Instream Uses

Panel Discussion: Richard Cassidy, *Army Corps of Engineers*
Jewelee Houston, *Houston Vineyards*
Roger Sherwood, *Pope & Talbot*
Victor Walder, *Eugene Yacht Club*

The Willamette River Basin provides water to two-thirds of Oregon's population and drains 11,200 square miles of land. That's a significant number of people and an area larger than Massachusetts and Connecticut. Richard Cassidy, Roger Sherwood, Jewelee Houston, and Victor Walder each represent a variety of sometimes competing interests that use the Willamette River. Cassidy estimated the average flow of the river is 24,000 cubic feet per second (cfs) at Salem: one would think that's enough to satisfy all the river's users, but it isn't. Each party faces challenges in the future as more people compete for the river's water and values change.

Regulating the River

Of the 25 dams on the Willamette, the Army Corps of Engineers (Corps) operates the 13 largest, which store 2.3 million acre-feet (maf) of water. Providing flood control, navigation, and irrigation water are the main responsibilities of the Corps, responsibilities mandated by Congress. The Corps also supplies water flows for fish and wildlife, water quality, and recreation. Each year in May, the Corps solicits input from federal, state, and local agencies, as well as the public, to help determine, within its mandated purposes, the amount of water to be released from its dams.

Navigation above Willamette Falls has practically ceased, and changing public values are demanding more consideration for recreation and instream flows for fish and wildlife. In response to these changes, Congressman Peter DeFazio has sponsored a study to determine whether the Corps' projects on the Willamette would benefit from a change in priority of functions: navigation would give way to recreation. When completed, the study will be a recommendation to Congress, since only Congress can authorize such changes. The Corps' responsibility is to come up with a management plan that best suits as many needs as possible, including flood control, irrigation, recreation, and instream uses.

Reducing Chlorine Use at Halsey, Oregon

"We're trying to move completely away from using chlorine at our pulp mill," said Roger Sherwood of Pope & Talbot. The Halsey mill currently produces 550 tons of pulp per day for manufacture into paper, and chlorine is a necessary part of the process. Eliminating chlorine would reduce the wastewater discharge needing treatment, and allow the mill to recirculate more water.

Pope & Talbot is planning to expand the production capacity of its mill to 1500 tons of pulp per day. It has the water-use permit, which is based on the mill's ability to recirculate and return much of the 18–20 million gallons withdrawn from the Willamette each day. "We have yet to get discharge permits for water and air—those are more difficult,"

said Sherwood. Discharge limits for dioxin, for instance, have been set at .3 milligrams per day (mg/day) by 1993. The Halsey mill is currently discharging .67 mg/day but is working on reducing that to next year's limit as soon as possible. Sherwood added that the discharge permit doesn't change, whether the pulp mill produces 550 or 1500 tons of pulp per day.

In addition to becoming chlorine-free, recirculating water and eliminating abnormal color in the river, which is a source of public concern, the long-term goals of the mill include creating wetlands to finish treating wastewater. "This is *long term*," said Sherwood. "It will take about 200 acres of wetlands to treat the water, but we know secondary treatment will not be enough." The wetlands will reduce biological oxygen demand (BOD), suspended solids, and soluble organics in the water. Farmers are interested in irrigating with water from the yet-to-be created wetlands, but the mill's water-use permit is based on it returning a substantial portion of the used water to the river. If the water is reused for irrigation, the net use is consumptive, and the mill won't satisfy the return flow requirement of its permit.

Farming and Instream Flow Protection

Jewelee Houston is a vintner near Eugene whose concerns represent agricultural water users along portions of the Willamette and its tributaries. According to Houston, irrigated agriculture faces possible competition from the State of Oregon.

Of the 2.3 maf of water stored behind Corps dams, the Bureau of Reclamation has rights to 1.6 maf. Since only about 2 percent, or 30,000 acre-feet, of the Bureau's Water is contracted for by irrigators, the remainder is considered discretionary flow, the timing and amount of its release subject to the judgment of the Corps. When discretionary water is released, it becomes part of the natural flow of the river. The state wants the allocated but unused portion of the 1.6 maf of water to protect instream flows; irrigators like Houston fear their allocated water will be reduced or even cut off if the state allocates this water to other uses.

Houston believes the public is too far removed from the farm: "We think our food comes from Safeway or McDonalds, and have forgotten about the farmer. The perception is that American farms produce excess food and are therefore somewhat expendable. We aren't, and we need water."

Boating on Fern Ridge Reservoir

Victor Walder estimated about one million people use Fern Ridge Reservoir annually for recreation. Chief users are powerboats and sailboats—Fern Ridge is recognized as one of the best lakes in the North-west for sailing. Continued recreation depends on using water that is currently allocated to the Bureau of Reclamation but is not being used, said Walder. If that water begins to be used by irrigators or by the state for instream flow protection, recreational users will no longer have the amount of water in the lake they now do.

Walder said recreational water users would like to see more water stored in the spring and in the fall, to extend the use season. This could conflict with releasing water for fish migration and lowering lake levels to accommodate winter and spring runoff.

Changing the timing of water releases to accommodate recreation may require modifying the mandated functions of the Corps and would require recreational users share costs of construction on some projects. Slackwater recreation has historically enjoyed the benefits of dams without paying construction costs. If recreation becomes one of the Corps' mandated priorities, will boaters be willing to pay part of those costs?

Keeping the options open on the Willamette depends on a number of variables, but perhaps the most far-reaching is the proposal to modify the Corps' functions for recreation and navigation, and determining who gets how much of the 1.6 maf of water allocated to the Bureau of Reclamation.

Water Transfers and Water Markets—Economic Equity

Bonnie Colby
Department of Agricultural Economics, University of Arizona, Tucson

Suppose a community in central Oregon has a chance to attract a major, high-paying, environmentally spotless industry but their current water supply is insufficient to assure adequate service during dry years. One option would be to purchase dry year water rights from the nearby irrigation district. This process, transferring water rights, has broad implications for future development in Oregon. In addition to shifting water from one use to another, it has the potential to alter rural social systems, and create ghost towns and abandoned farms.

Water Development, Then and Now

The Bureau of Reclamation began to develop water resources in earnest with the passage of the 1902 Reclamation Act. This development, said Bonnie Colby, was the old style: local water users and state governments realized the expense of distributing water to all who needed it was beyond what they could afford, so they turned to the federal government. The results include many dams, canals, and other facilities designed to distribute water throughout the arid west.

Now, the water distribution infrastructure is mostly in place. Even the federal government, the "deep pockets" of reclamation, can no longer afford to build dams and huge distribution systems like California's Central Valley Project. We are left to make our existing infrastructure, primarily designed for irrigated agriculture, supply a variety of innovative uses.

- When parts of the Snake River froze a large population of trumpeter swans out of their food supply in 1989, several groups including the Nature Conservancy got together to increase the flows on the river to break up the ice.

- Urban population growth in Casper, Wyoming forced the city to obtain more water. The city and the Casper-Alcova Irrigation District worked out a mutually-beneficial agreement in which the city is paying for lining parts of the district's canals. The city receives the 7,000 acre-feet of conserved water.

- Orchards in the Yakima Valley of Washington were in danger of dying during a recent drought. Farmers growing annual crops like alfalfa agreed to share their water allocation, so the expensive "permanent" orchards would not die.

- Indian tribes on the Wind River in Wyoming elected to use their substantial water rights, not for diversion to irrigated agriculture, as was anticipated by the federal government, but for instream flows. Some farmers in the area thought this to be wasteful, a non-beneficial use.

- In Utah, the Intermountain Power Project bought water rights from farmers to run a 1500-megawatt power plant. Farmers could sell if they chose to, but were protected if they didn't.

These transactions cited by Colby indicate a shift away from the predominantly agricultural use that water development was initially designed to serve. Innovative transfers like these are increasing. Some cities are signing "dry year contracts," to allow them to buy a specified amount of water in dry years only. When water is plentiful, cities are not obligated to buy water they don't need.

According to Colby, there are two motivating forces for using temporary transfers and exchanges instead of permanently selling or transfering water rights. Cities want reliable water rights and supplies, mostly in response to an increased consciousness of drought. Second, there is a need to respond to more diverse interests, interests that historically weren't important. Water quality, the Endangered Species Act, and recreational needs are a few examples of these interests.

Water Markets—Not a Simple Sale

"When we think of a market transaction, we tend to think of a buyer and seller. The two agree on the terms of sale, and that's that," said Colby. Selling or transfering water rights is much more complicated because other parties can be affected. For example, if a transfer moving water from agriculture to municipal purposes is proposed, a host of agencies and interests are involved. Among them:

- The State Water Agency—they grant the initial water right and must approve any new use.
- The State Corporation Commission—establishes or approves urban water rate structures.
- Federal agencies—the Department of Interior is involved in tribal transactions, and the Environmental Protection Agency is involved in transfers affecting threatened and endangered species.
- The Bureau of Reclamation—if they are the wholesale water supplier.
- Small towns—irrigated agriculture is frequently located nearby and is critical to their economic base.
- Farmers—generally, they have voting rights within an irrigation district.

Colby referred to those indirectly affected as third parties. They may include crop marketing associations, seed and tractor dealers, food processing plants, farm workers, and perhaps consumers, concerned about the price of food.

Over- and Under-regulating Water Transfers

Because agriculture uses the largest proportion of water in the west, water markets were initially seen as a threat to agriculture, especially where it was important to a state's economy. Now, marketing is being encouraged, but we need to address how to regulate water markets. While the efficiency that water markets can promote is desirable, some of the social costs are not. If we over-regulate, we limit market activity and lose efficiency. If we under-regulate, we increase the chance of negative third-party impacts and social costs.

One of the biggest difficulties in establishing transfer policies is that we are still learning about the benefits and costs of transfering water. Until we can identify and measure impacts, it's going to be difficult to tell whether we're over-regulating or under-regulating.

Third-Party Costs of Water Transfer

We *do* know that in many ways markets are a more efficient means of allocating water. "Efficiency," as it applies to water transfers, tends to mean that water flows to the party willing to pay the most for it. Markets therefore tend to exclude instream flows, fish, and some social concerns.

Colby cited several examples of external costs, or costs to water transfers that can occur aside from, but as a direct result of transfers.

1. Impaired supplies to other water right holders. For instance, a downstream appropriator may depend on return flows from an upstream user. Under the laws of most western states, this impact must be considered when a transfer is proposed.

2. Streamflows may be adversely affected. Environmental attributes, recreational uses, and water quality may be compromised. These are considered "public goods" by economists and may not be included by the market. Sportfishing and kayaking are two uses that may be affected by the availability of instream flows.

3. Water quality has often not been considered when a transfer that may be detrimental to water quality is proposed, and this is a concern.

4. Many local economies depend on recreation, which requires clean water in a stream or lake. A proposed transfer may reduce the available water.

5. Social impacts on areas of origin. For example, if a municipality buys irrigation water rights in a rural area, jobs may be lost, the local tax base may decrease, community structure might be disrupted, and the remaining irrigators may pay more to maintain pumps and canals, since those costs are divided among fewer people.

Colby said there are two widely varied philosophies held by economists and policymakers about impacts on local economies. One is that these shifts in use are a natural change and that it's not the responsibility of government to compensate those disadvantaged. The other view holds that rural areas have a stake in the transfer process and should be compensated for tax revenue losses and other effects of the transfer.

Reducing Third-party Effects

One way to improve the efficiency of a proposed transfer, said Colby, is to be sure that all the affected parties have an incentive, or a role in the transfer process. Like a poker game, everybody at the table needs chips to bargain with. These "chips" are money, a good to sell, in this case water, or the power to impose transaction costs. In an agriculture-to-municipal transfer, for example, the agriculture water user has the water that a city is willing to pay for, and the Department of Fish and Wildlife, under some states' laws, would have the power to impose a transaction cost. In such a case, the transaction cost to account for impacts on fish might be water rather than money—a certain amount left in the stream for fish passage, for instance.

This type of system would satisfy the rule governing transfers that states "no injury." If all parties involved in a transfer have bargaining power, "no injury" translates to mean that while there may be some adverse effects on some of the parties, they would be compensated, a compromise reached.

Deciding Which Values are Important

A significant aspect of having bargaining power to influence water transfer approval is that we decide what we want our state to look like, by establishing bargaining power according to our values. As Colby pointed out, the western states have different characteristics and emphases. Each state reflects those values.

- Arizona—Agriculture represents less than three percent of the jobs and gross output in the that state. Ninety percent of the population is in cities. State water laws encourage transfers to the urban centers of Phoenix and Tucson. Realizing that land is virtually worthless without water, the state's policy prohibits water from being sold without the land it supplies.

- Montana—Recreation and tourism are primary sources of revenue, so maintaining high-quality instream flows of water is a priority. Montana has determined that its water is subject to the public trust, a determination that makes the public good a priority.

- New Mexico—Quaint towns and the Indian culture are the main tourist attractions. Many of the recreational streams are high in the mountains and fortunately are not affected by New Mexico's position that maintaining instream flows does not constitute "beneficial use."

"Oregon's water policies," said Colby, "are considered progressive in comparison to other states." Oregon is one of the first to aggressively pursue instream flow protection. And if we continue to move toward water markets and transfers, perhaps it's time to determine what characteristics we want Oregon to have, to determine our values and establish statutory protection accordingly.

Recommendations

How can we make the market transfer process work to ensure the most effective use of water? Colby made six recommendations.

1. Give bargaining power to affected parties. Every party who has an interest will get the best information they can to support their position and influence the outcome of the transfer approval process.

2. All information provided by parties should be part of the public record. Many engineering and hydrologic studies are done by private companies, and this information is frequently proprietary. Subsequent transfer proposals may therefore repeat work that has already been completed, but is unavailable. Public information would save time and money, be available for future negotiations, and provide cumulative information on basin hydrology, fish populations, local economies, and other characteristics.

3. Establish a "rebuttable presumption" on the quantity of water that may be transferred.The state should set guidelines for the amount of water "presumed" transferable in a particular basin, for instance, three acre-feet per irrigated acre. This would save transaction costs by reducing uncertainty. A transfer applicant may "rebut" the amount of water determined transferable by the state. In this situation the burden of proof would be on the applicant.

4. Require mediated sessions on objections or conflicts before parties have to go to a formal hearing or begin litigation. Mediation could reduce the strain on the court system and save taxpayer money.

5. Spread transfer benefits broadly. In Oregon, the state keeps 25 percent of conserved water—since the public pays taxes, it seems appropriate that we should share in the benefit of transfers. Colby was recently asked what kind of transaction cost might apply to water transfers at the federal level. She suggested a 10 percent portion of the water being transferred to start with, to go toward the public benefit. Such a charge would mitigate some of the effects the market isn't designed to consider.

6. Keep the transfer process in the public arena. All the parties who feel they would be impacted can sit at the negotiating table, and conflicts can be resolved once and for all, saving time and money in the future.

Water transfers hold promise for the future, yet we must learn more about their benefits and costs and find a balance between over-regulation and discouraging transfers, and under-regulating and adversely affecting too many parties. Our values will help determine the uses to which our water will be put.

What'll You Do When there Ain't Enough—The Experts' Answers for Water Shortages

Bob Main *Oregon Department of Water Resources*
Charles "Chuck" Norris *State Representative, District 57*
Tom Penpraze *Public Works Department, City of Corvallis*

FOR SALE: 2.4 ACRES OF WATER—NOW IN DITCH. PHONE 555-2369.

Many people don't think of water as a commodity likely to appear in a newspaper's classified ads, but Bob Main says the Bend *Bulletin* has several on any given day in the spring. Throughout the state, water users are responding to a seventh year of drought in different ways.

In central Oregon, transferring water rights is about the only option available to irrigators. Groundwater lies more than 400 feet below the land and pumping costs are prohibitive for most agricultural users. There are no sites to build more storage. "Advertising in the paper may not be the most sophisticated way of marketing water, but it works," said Main.

In the Klamath Falls area, winter and spring have been extremely dry, and some irrigators have applied for emergency drought relief. For those users whose water rights are jeopardized by a lack of water (those who hold a junior water right), an emergency permit for groundwater use can be obtained from the Oregon Water Resources Department (WRD). The permits cost at least $600 but can provide water for crops that may not otherwise receive any. The emergency permits stay in effect until the drought declaration expires.

Irrigators in the Umatilla Basin also have limited surface water, though they have the advantage of upstream storage. Representative Charles "Chuck" Norris said that of the five Critical Groundwater Areas in the state, three are in his district, which encompasses the northern parts Morrow and Umatilla counties.

Responses to Water Shortages

"Irrigators have two responses to water shortages," said Main. The first response is to use it until it's gone. For areas like the John Day Basin that rely on natural surface flows, predicting how much water will be available for the growing season is difficult. Extended periods of hot weather, for instance, may cause faster evaporation than originally predicted.

Predicting water availability is easier when it's stored. In Jefferson County, for example, irrigation users rely on stored water. "They knew in January, within a couple thousand acre-feet, how much water would be available for irrigating this year," said Main. The stored water irrigates about 60,000 acres, and each farmer is going to have about 40 percent less water than normal. As a consequence, 40 percent of their land is idle.

A second response is to manage stored water. "This past winter, in preparation for what we knew was going to be a dry irrigation season, we created an incentive to use stored water more efficiently," said Main. Irrigation districts with the first rights to the river have little incentive to delay irrigating beyond the first day they can legally begin applying water. In an agreement between three irrigation districts and the WRD, the

districts agreed not to turn their canals on at the first opportunity. In exchange, the WRD will credit the districts for half the water they don't divert with water in the reservoir. The result: natural flows increase past the point of the districts' diversions, and the irrigation districts have water in storage for later use. As Main pointed out, this agreement allows the irrigation districts the benefits of stored water without having invested any money in the storage facility.

Another common response to water shortage is to find an alternate source of water, usually by drilling a well. Though this isn't feasible in some parts of the state, groundwater is close to the surface in other areas: According to Main, the WRD has about 121 cubic feet per second in applications pending for wells in the Klamath Basin.

Some people are critical of the speed with which the WRD issues water rights, and Main admitted the department is slow, but cautioned that "a water right is forever." The WRD must carefully evaluate the consequences to other parties of each water right it issues.

Corvallis' Water Supply

According to Tom Penpraze, the City of Corvallis has prepared water curtailment plans in response to a water shortage, but doesn't foresee having to implement them this year. "We're in pretty good shape here," said Penpraze. Corvallis has two water sources: the Willamette River and a 10,000-acre closed watershed on Mary's Peak.

The average annual use by the 45,000 people in Corvallis is 7.4 million gallons per day (mgd). Water use ranges from approximately 12 mgd in the summer to 6 mgd during winter, and is supported by 8 water rights dating from 1907 to 1970, which provide a total allocation of 64.7 mgd.

Curtailment Plans for Corvallis

Though Corvallis has a reliable water supply, the city is still required to have curtailment plans in place. "If we were faced with the need to cut back on our water use, the city parks, which use approximately 36 million gallons in the summer, would be the first to reduce water use," said Penpraze. Reduced municipal irrigation would be followed by restrictions on outdoor use for residences and businesses. Commercial use would be restricted next, but since jobs are at stake, that is a last resort. Corvallis is an attractive city, and its citizens take pride in that—well-kept lawns, mature trees, parks and greenbelts contribute to the city's attractiveness. These outdoor uses represent by far the largest proportion of use, far more than total domestic uses. If curtailing water use became necessary, the biggest savings would come from reduced outdoor use.

Penpraze said the city managers are aware of the statistic that consumptive municipal uses such as landscape maintenance account for only five to seven percent of the surface water withdrawn in the state. Considering this statistic, Penpraze posed the question, "is municipal curtailment going to solve the state's water supply problems?" Penpraze also asks us to think about whether the current water shortages are physical or institutional. If physical, curtailing consumptive water use in the city would save a small amount of water. If current water shortages are institutional, reallocation among users may solve the problem.

Future Water Supplies for Corvallis

Corvallis may be forced to seek additional water supplies in the future. One possibility is to contract with the Army Corps of Engineers (Corps) for some of the water stored on the Willamette.

Purchasing water from the Corps seems a logical way to augment the city's supply, but several questions must first be answered.

Currently, the water discharged from Corps dams is not fully allocated. The WRD is working on regulations to answer some of the questions about this water: who can use it, and when? Who can't, and why not?

Another question about purchasing the stored water concerns the pricing structure

now in place. "The current pricing structure, as we understand it, will allow irrigators to purchase water from these upstream reservoirs for a range of $1–4 per acre-foot. The cost for municipal use is estimated to be $1,500 an acre-foot." One long-term goal is to bring the costs of municipal water more in line with agriculture prices of water, and that will take a congressional mandate.

Though Corvallis will not be faced with this decision in the near future, additional water supplies will, in all probability, be needed at some point. In that case, Corvallis might be competing with other uses such as recreation, instream flow protection for fish and wildlife, and industry for Willamette River water.

Finding a Starting Point to Resolve Conflicting Uses

Because his district has 55 shoreline miles along the Columbia River, and about 95 percent of the water diverted from that river in Oregon for irrigation is within Norris' district, he acknowledged an orientation toward his constituents, many of whom are irrigators. Norris says we need to better appreciate the close connection between irrigated agriculture and a plentiful supply of affordable food. Norris predicts a loss of agricultural water will show up in supermarkets: "In the Central Valley of California, for example, irrigators have less water than in the past. It's likely the price of lettuce and other produce will increase."

Norris views his role of politician as a catalyst between irrigators and instream water users. Water is a finite resource, and is being subjected to the pressures of changing values, values that include environmental considerations and increasing demands for urban water supplies. Norris said he no longer sees the competition for water as "rural versus urban." Both cities and agriculture are concerned about their water supplies—the key is to address this as a common challenge and work out equitable solutions. He compared irrigators, fish and wildlife interests, municipal users, and environmental needs to circles with areas of intersection, or common ground. "We need to use that common ground as a starting point to resolve differences."

Protecting Streams Better

Norris is working on a water policy of "Equitable Streamflow Management." The policy seeks to "recognize the public benefits of low-cost agricultural products and power as well as instream, recreation, fishery, and wildlife benefits." One goal of the policy is to address watershed conditions before fisheries stocks become threatened. Another is to promote incentives for efficient water use instead of punitive measures. Under this policy, certified and reserved water rights will not be affected, and water marketing or transfers would be allowed. "We can't make it rain, we can't make it snow, but we can encourage more judicious use of water, and store water in times of plenty, for use when it's scarce," said Norris.

Norris will again introduce a bill in the state legislature calling for water storage to have a higher priority in Oregon's water management: the bill did not pass the senate during the last legislature. The WRD recognizes the value of stored water, and is holding a series of public hearings around the state on the policy of water storage. The policy asserts that storage will provide increased water management flexibility, an idea that Norris supports, especially because of its importance to future generations of Oregonians, who will be confronted with a larger population and the same amount of water.

Whether water shortages in Oregon are physical or institutional, a growing population, changing public values, and the continued need for agricultural water are going to demand some difficult decisions. Each use may have to compromise, and together, we will have to decide what constitutes a judicious use of water.

Extension Service, Oregon State University, Corvallis, O.E. Smith, director. This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties.