The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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& More!

THE COLORADO RIVER

HAS IT RUN OUT OF WATER?

by Lawrence J. MacDonnell, Porzak Browning & Bushong LLP (Boulder, CO)

On May 2, 2005, US Secretary of the Interior Gale Norton decided to maintain water releases from Lake Powell's Glen Canyon Dam at the currently established level for the balance of the 2005 water year. This decision came despite five consecutive years of well-below normal runoff in the Upper Colorado River Basin (Basin), which brought storage levels in Lake Powell down to 34% of capacity. In her letter to Basin state governors, the Secretary explained her decision as based on the improved snow pack this spring in the headwaters (which is slightly above average).

Close observers of the Basin should not have been surprised by the secretary's decision. Change of any kind does not come easily in the Colorado River Basin, and reducing the amount of water released from Lake Powell would have meant changing a practice that has been followed since 1970 — exacerbating disagreement among the seven Basin states.

The Colorado River and its tributaries are shared by seven states, two nations, and dozens of Indian tribes. Hydrologically speaking, the Basin is a modest source of water — generating an average of perhaps 17-to-18 **m**illion **a**cre **f**eet (MAF) of water annually. Formal allocation of the right to consumptively use 17.5 MAF has been established under the 1922 Colorado River Compact (Compact) and the 1944 Treaty with Mexico. Under these agreements 8.5 MAF is allocated to the Lower Basin, 7.5 MAF to the Upper Basin and 1.5 MAF to Mexico.

As the map on the next page illustrates, the two parts of the Basin in the US are hydrologically-defined, with a dividing point on the river at a point in northern Arizona called Lee Ferry. The Upper Basin includes significant portions of Colorado, Utah, and Wyoming and a portion of northwest New Mexico and northern Arizona. The Lower Basin includes almost all the rest of Arizona, and small portions of California, Nevada, New Mexico, and Utah.

Estimated consumptive uses of the Basin's water between 1996 and 2000 averaged over 19 MAF per year. About 11.8 MAF of this use occurred in the Lower Basin (not counting evaporation losses of about 1.3 MAF), with another 2.9 MAF going to Mexico. FOUR IMPORTANT CONCLUSIONS MAY BE DERIVED FROM THE PROCEEDING INFORMATION:

- More water was being consumed on average each year in the Basin between 1996 and 2000 than the Basin apparently produces
- Lower Basin users exceeded their 1922 Colorado River Compact allocation
- More water went to Mexico than was legally obligated
- Upper Basin still is not consuming its full Compact allocation

By 2004, storage in Lake Powell was dropping to levels not seen since it first filled in the 1960s. The Upper Basin states began seriously contemplating the possibility that some existing uses might have to be curtailed if the drought continued. Storage in Lake Powell is regarded by the Upper Basin as its savings account. Under the 1922 Compact, at least 75 MAF of Colorado River water is expected to flow to the Lower Basin during every consecutive 10-year period. If native runoff in the Upper Basin is not sufficient to

Colorado River

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Colorado River

Drought Management

Water Availability

Compact Apportionment

meet this requirement and also supply current uses, the savings account in Lake Powell is tapped. Had the drought continued another two-to-three years, those savings would have been exhausted. At that point, consumptive uses in the Upper Basin would have to be cut back.

In December 2004, federal Interior Department officials urged the Basin states to work out an agreement for management of Lake Powell in the event the drought continued. Secretary Norton promised a mid-year review (in April 2005) at which she would consider changes to the annual operating plan. Reportedly, the states never seriously engaged in the task of developing criteria for management of Lake Powell under water shortage conditions. Instead, long festering disagreements about such things as responsibility for meeting the 1944 Treaty obligation to deliver water to Mexico emerged. With no agreement among the states respecting change, the Secretary chose to retain the status quo.

The Basin is at a crossroads. The drought brought attention to growing Basin consumptive uses and whether such uses already equal or even exceed Basin water supplies. At a minimum it highlighted uncertainties about the availability of water for additional consumptive uses, especially in the Upper Basin. Yet, except for California, all of the Basin states plan to increase their consumptive uses of Basin water.

Obviously, it would be helpful to have operating criteria for Lake Powell in conditions of shortage. However, even more fundament is the need to revisit our understanding of the Basin's hydrology and to reconsider existing and planned Basin consumptive uses in light of this hydrology. In the process, a number of uncertainties in the Law of the River may need to be addressed as well.

Lake Powell

Basin Hydrology

Measurements of the Colorado River between 1896 and 1921 at Yuma, Arizona (just above the border with Mexico), suggested an annual average undepleted flow of at least 18 to 20 MAF, with perhaps 2 to 3 MAF of this amount coming from tributaries below the Utah-Arizona line, including the Gila River. Based on this information, Compact negotiators found agreement by dividing the Basin into two parts and apportioning consumptive use of 16 MAF roughly equally — this gave 7.5 MAF to each Basin plus an extra 1 MAF to the more rapidly developing Lower Basin, but preserved in perpetuity the Upper Basin's right to consume its apportionment whenever its uses reached that level. The negotiators fully believed there was more water available, but they left that water unallocated—in part to take care of any future obligations to Mexico that might arise. They even provided for further apportionment of Basin water if, after 40 years (1963), either sub-Basin was fully consuming its original apportionment.

Colorado River

Undepleted Flow Studies

With nearly 120 years of recorded flows, it is now evident the pre-Compact period was an unusually wet one. Subsequent analyses of Basin hydrology have focused on the Upper Basin, seeking to reconstruct virgin flows that would have passed the Lee Ferry dividing point. The most optimistic of these studies, based on about a century of recorded data, estimates annual average undepleted flows generated in the Upper Basin of about 15 MAF. An analysis based on tree ring data going back to the 1500s estimated annual average virgin flows of about 13.5 MAF at Lee Ferry. A study in the mid-1960s, using the previous 30-year period (including the 1930s drought), suggested flows of about 13 MAF. And an analysis focusing on the lowest 10-year period of record found reconstructed flows of 11.8 MAF.

Upper Basin

The reason these analyses all consider only Upper Basin hydrology is the Compact provision limiting Upper Basin uses from reducing 10-year cumulative measured flows at Lee Ferry below 75 MAF. No doubt Upper Basin state negotiators felt comfortable in 1922 with this provision. While runoff certainly varied from year to year, evidence to that point suggested there would be no problem passing to the Lower Basin up to 75 MAF over 10 years and still consuming as much as 7.5 MAF every year. In fact, as studies now document, Upper Basin hydrology cannot support both objectives. The US Bureau of Reclamation has suggested Upper Basin consumptive uses may not be able to exceed 6 MAF.

Allocations and Uses

1996-2000

Let's take a closer look at how the Basin's water is being used and by whom. The Bureau of Reclamation's Consumptive Uses and Losses Report for 1996 to 2000 is the most current comprehensive information available. According to this source, average annual consumption in the entire Basin—including Mexico—exceeded 19 MAF during this period. Direct uses in the Upper Basin accounted for an average of 3.7 MAF, while mainstem reservoir evaporation added another 682,000 acre-feet (AF). Direct uses from the mainstem river in the Lower Basin consumed an average of about 8.0 MAF, with mainstem reservoir evaporation adding 1.3 MAF. Consumption from Lower Basin tributaries was about 2.5 MAF. The remainder was water that went to Mexico, an average in this period of about 2.9 MAF.

Use Purposes

Of the approximately 16 MAF consumed in the US, about 65% went for agriculture, 20% for municipal and industrial uses, and about 15% was lost to evaporation. Not counting mainstem reservoir evaporation or other water losses, consumptive uses in California averaged slightly more than 5 MAF per year, compared to about 4.7 in Arizona and about 2.0 in Colorado. Over 2 MAF of Arizona's use was from its tributaries, primarily the Gila River.

Allocations v. Use

Since the early 1950s, California has been using more than the basic 4.4 MAF allocation to which it was required to limit itself in the 1928 Boulder Canyon Project Act [to view the Act and for additional information, see website: www.ourdocuments.gov/doc.php?flash=old&doc=64]. The seven major users in that state got contracts for delivery of about 5.3 MAF of water from Lake Mead from the Secretary of the Interior in the early 1930s. At that time Arizona and Nevada were using little water from the Colorado River, and consumptive uses in the Upper Basin were only about 2 MAF. By the 1990s, however, Arizona and Nevada uses were pushing their respective mainstem allocations of 2.8 MAF and 0.3 MAF, and California uses were averaging about 5.2 MAF per year.

How is it that total consumptive uses in the Lower Basin reached these levels when the 1922 Compact apportioned only 8.5 MAF? The short answer is that this level of *Lower Basin* demand has occurred under conditions where the total consumption in the *Upper Basin* (including evaporation from the large mainstem reservoirs) still has not reached 60% of the *Upper Basin*'s Compact apportionment.

However, the longer answer is both more complex and more interesting.

Lower Basin Consumption

It begins with Arizona's success in the 1928 Boulder Canyon Project Act, which included a Congressional guarantee that it could fully consume all the waters of the Gila River Basin, together with assurance that this source of water would never be required to meet future delivery obligations to Mexico. The story continues with contracts from the Secretary of the Interior providing for deliveries of water from Lake Mead (the reservoir behind Hoover Dam) to Arizona, California, and Nevada that would *enable consumptive uses* of about 8.4 MAF annually in these three states. Note: these are not simply releases of 8.4 MAF, but rather releases of the amount necessary to enable deliveries of water that would result in 8.4 MAF of consumption. The answer includes the treaty commitment in 1944 to deliver at least 1.5 MAF annually to Mexico, at times in which this water can be used—not just when it is available. One must also consider the 1963 US Supreme Court decision in *Arizona v. California*, 373 US 546 (1963) in which the Court decided that Congress, in the Boulder Canyon Project Act, had allocated the Lower Basin's Compact apportionment of 7.5 MAF of consumptive use among only three of the five states physically located within the Lower Basin and had limited this apportionment to waters of the mainstem Colorado coming from the Upper Basin — apparently leaving Lower Basin tributaries for additional consumptive use.

Colorado River

California Agreement

Storage Procedures

Hydrology Analysis

Increased Use v. Delta Flows

Upper Basin Consumption

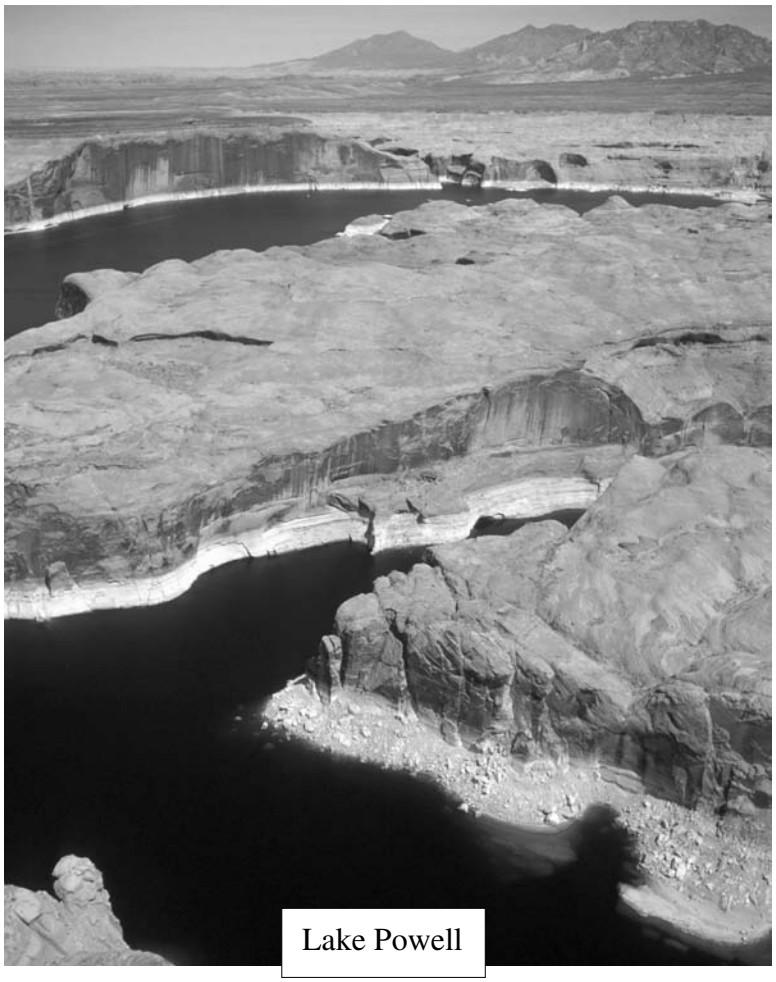
Finally, it includes Congressional funding for most of the physical structures in the Basin that make possible substantial control and use of mainstem waters at greatly subsidized costs to the users—including storage capacity for more than 60 MAF of water.

Aligning Uses with Supply

The first big step in moving the Basin back towards more balance culminated in 2003 with successful completion of a 12-year-long process by which California's consumptive uses are to decrease within 15 years to the 4.4 MAF limitation required in the Boulder Canyon Project Act. This reduction in California's consumption of Colorado River water primarily involves the transfer to urban use of some (perhaps as much as 20%) of the more than 3.5 MAF that now goes to irrigated agriculture in California. See Moon, TWR #7.

Development of a drought management strategy, as the Secretary has called for, would also help by clarifying operating procedures for Lake Powell and Lake Mead when low runoff periods, like that between 1999 and 2004, threaten to limit Basin consumptive uses. It's not clear at this point, however, if the Basin states are prepared to work together to develop such operating procedures. Some in the Upper Basin appear determined to challenge the existing operating criteria for Lake Powell under which the "minimum" annual release from Glen Canyon Dam is fixed at 8.23 MAF. At issue is both the assumption in these criteria that the Upper Basin is responsible for half of the Mexico Treaty water and that 7.5 MAF must pass Lee Ferry every year, even though the 1922 Compact only calls for 75 MAF over 10 years.

Perhaps more useful at this point would be a careful reevaluation of the Basin's hydrology, looking at Lower Basin tributaries as well as the headwaters. With more than 100 years of recorded data it may be possible to produce a better estimate of the Basin's long-term water supply and to better determine what portion may be regarded as reliably available and usable, given the Basin's extensive storage system and the legally-protected apportionments that have been made. The wild card of climate change needs to be fully factored into this analysis as well.



Lake Powell

Challenges & Questions

Should the necessary hydrologic analysis conclude that consumption of Basin water is in fact close to exhausting the reliable supply, the Basin states and the Secretary face some important challenges. All of the Basin states, except California, have expectations to increase consumptive uses.

Environmentalists, on the other hand, would like to restore flows to the Colorado's delta at the Gulf of California. If there are to be additional uses of Basin water it seems likely such uses will require some reallocation from and among existing uses.

Certainly the Upper Basin expects to eventually consume more of its 7.5 MAF Compact apportionment, but how much more? 1 MAF? 2 MAF? The answer to this question is not purely hydrologic; it also depends on resolution of ambiguities under the existing interpretation of the Law of the River.

Colorado River

Mexico Deliveries

Questions

Evaporation

Upper Basin Concerns

Reservoir Operations

Data Needs

Must the Upper Basin factor in at least 750,000 AF annually for delivery to Mexico (i.e., one-half of the 1.5 MAF allotment)? The 1922 Compact suggested this water would come from unapportioned Basin supplies. On the assumption there probably is no such unapportioned water, the Secretary of the Interior has been operating Lake Powell since 1970 to release annual totals that include this amount of water, invoking the Compact language imposing an equal burden on each Basin if there is a "deficiency." The Upper Basin formally objected to this assumption in 1970 and may be interested now in pushing for reconsideration. Is there unapportioned Basin water that could meet the Mexico obligation?

What is the Lower Basin's legally-protected apportionment? The 1922 Compact apportioned 8.5 MAF of Basin water for Lower Basin consumption. The Boulder Canyon Project Act gave Arizona full consumptive use of the Gila. Is that in addition to the Compact apportionment or included in it? The US Supreme Court gave Arizona, California, and Nevada 7.5 MAF of mainstem water from the Upper Basin (in *Arizona v. California*, supra). Does that alter the Compact apportionment? Are other Lower Basin tributaries available for additional consumptive use? How is such use accounted for under the apportionments? To what water does the Compact's apportionment of an additional 1 MAF apply? Was it intended to cover tributary consumption? If so, what is the status of existing and future tributary consumption beyond this amount?

How is the roughly 2 MAF of water lost to evaporation from the large mainstem reservoirs to be counted in relation to the apportionments? Should these losses be subtracted from the apportionment of the Basin in which the reservoirs are located? Is Lake Powell, located in the Upper Basin, really an Upper Basin reservoir? How should water lost to consumption in the US but needed for delivery to contract diversion points in the Lower Basin be counted? Can deliveries to Mexico be better managed?

Likely the Upper Basin will be increasingly concerned with any uses in the Lower Basin or Mexico that consume water beyond that determined to be legally apportioned under the Law of the River. Historically, such uses have escaped close scrutiny because there appeared to be enough water. There may well still be enough water, but it now appears likely that much of this use comes out of as-yet-unconsumed Upper Basin apportionment. The Upper Basin may be interested in being assured that those enjoying the benefit of this water below Lee Ferry now and in the future understand this enjoyment is not guaranteed in perpetuity. Moreover, as water available for in-state consumption tightens, questions of priorities and entitlements for these uses are certain to increase. Clarifying use rights will facilitate needed reallocation as well.

Are the federally-owned mainstem reservoirs being operated in a manner that appropriately reflects current information about Basin hydrology and water uses? Certainly the matter of developing shortage criteria for releases from Lake Powell is in need of attention. It may be time to take another look at whether operations of Lake Mead and Lake Powell could be better coordinated to more effectively manage the river's water.

As the system tightens, timely and accurate information about all consumptive uses in the Basin becomes increasingly important. At present this information is produced for 5-year periods and takes several years following the end of the final year to be produced. It may be time for the Basin states and the Interior Department to develop credible mechanisms for generating this information on an annual basis.

Conclusion

If the snowpack returns to the Upper Basin in coming years as it did this last winter it will be tempting to return to business as usual in the Basin. If instead we see a continuation of below normal conditions, business as usual won't work. In any case it seems clear the Basin's water supply is fully claimed and that additional uses will not come as readily as did existing uses. It's a new game in the 21st century. Are we ready?

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Restoration

WATER AND THE ENVIRONMENT

THE ROLE OF ECOSYSTEM RESTORATION

by Sharon B. Megdal

On April 6, 2005, the University of Arizona Water Resources Research Center (WRRC) held another of its annual water conferences in Tucson, Arizona. This year the topic was "Water and the Environment: The Role of Ecosystem Restoration." This article provides a summary of some of the insights and information shared at the conference.

ARMY CORPS KEYNOTE

The keynote speaker, Mr. Bill Dawson, Director for Civil Works Planning and Policy for the US Army Corps of Engineers (Corps), provided an interesting perspective on ecosystem restoration. He noted that the environmental aspects of a project must be considered part of the whole. Dawson cautioned against simply adding-on environmental considerations to a developed project like the "extras" added to sweeten a car sale. In order to avoid the piecemeal approaches of the past, the Corps has developed a strategic plan which incorporates environmental operating principles.

Corps Principles

CORPS ENVIRONMENTAL OPERATING PRINCIPLES INCLUDE:

- Strive to achieve Environmental Sustainability
- Recognize the interdependence of life and the physical environment
- Seek balance and synergy among human development activities and natural systems
- Continue to accept corporate responsibility and accountability
- Seek ways and means to assess and mitigate cumulative impacts
- Build and share an integrated scientific, economic, and social knowledge base
- Respect the views of interested individuals and groups.

Balance

Dawson noted that leaders, by definition, set direction and that effective environmental sustainability requires "a process whereby environmental and economic considerations are effectively balanced in project planning, design, construction, operation and maintenance."

Evolving Corps

Mr. Dawson explained how Corps projects fit within this new strategic approach using examples from the Florida Everglades, the Louisiana Coastal Area and various projects in Arizona. He noted that the current make-up of Corps personnel reflects evolving programs and areas of focus. Thirty years ago, over half of the Corps' 40,000 employees were engineers. There were virtually no scientists. Today, with 35,000 employees, the Corps has 7,000 engineers and over 14,000 scientists.

Dawson would like to see the United States be a world leader in environmental restoration and see more of it done here at home because "it is the right thing to do."

ECOSYSTEM RESTORATION OVERVIEWS

Three academicians provided additional overviews of ecosystem restoration.

National Database

Professor Cliff Dahm, University of New Mexico, spoke on "River and Riparian Restoration in the Southwest: A Summary from the National River Restoration Science Synthesis" (Synthesis Project). Professor Dahm provided an excellent overview of national and southwestern restoration projects. The Synthesis Project's objective is to characterize the status of restoration projects, including how science is used, and to identify activities that make restoration successful. The Synthesis Project has conducted numerous interviews to find out more about individual projects and established a national database which is available to interested parties. The researchers utilize information from both federal databases and local sources. Thirty states and 40,000 records are included in the database.

Motivators

Professor Dahm's presentation showed breakdowns of the project by geographic area, intent of project and data source. Arizona had 197 of the 600 projects in the Southwest. The data indicate that the primary motivations for restoration projects are water quality management and riparian management. He noted the uneven nature of monitoring and assessment. The federal databases reflect only a small fraction of the total number of restoration projects, although they do include a significant fraction for some regions (such as the Southwest). However, the federal databases are better than regional sources at tracking cost and monitoring information. Differences between federal and regional data sources and among the regions themselves exist, in part, because of different definitions of restoration by states, regional management goals, and levels of coordination and cooperation among regional management authorities.

[SYNTHESIS PROJECT WEBSITE: www.nrrss.umd.edu/

Professor Dahm was a co-author for the article, "*Synthesizing US River Restoration Efforts*" which appears in the April 29th issue of Science]

Restoration

Ecosystem Improvements

Resilience

Landscape Context

Multiple Objectives

Professor Julie Stromberg, Arizona State University, addressed the question: How do you measure the success of a restoration project? Her presentation examined two important indicators: ecosystem improvement and increased resilience.

MEASURES OF ECOSYSTEM IMPROVEMENT INCLUDE:

- Improved water quality
- Increased riparian vegetation abundance
- Increased population viability of target species
- Increases in bioassessment indices

Increased resilience refers to a system's capacity to recover from natural disturbances such as floods and drought. This increased resilience would be indicated by the fact that few interventions would be needed to maintain the site.

Professor Stromberg discussed some specific Arizona restoration projects in the context of the landscape in which a restoration site is embedded. She questioned whether restoration success was even feasible given the current state of some landscapes. Where and how can we re-establish connectivity within and between river sites? What ongoing interventions will be necessary, if connectivity can't be restored? Concerning restoration along the Salt River in the Phoenix metropolitan area, she noted that different projects along the river create opportunities for experimentation and hypothesis testing. It is possible to design large-scale experiments, with each restoration project or river reach functioning as an experimental unit.

As a segue from the general to the specific, your author gave the final presentation of the overview panel, entitled: "A Look at Ecosystem Restoration in Arizona" — based primarily on a nearly-completed study funded by the Corps. This study (as well as another ongoing study funded by the US Bureau of Reclamation) is designed to foster understanding of environmental enhancement projects in order to inform decision makers, professionals, and the public as they consider future investments to utilize water in a way that meets multiple public objectives. Eleven ecosystem restoration projects in the Tucson and Phoenix areas are included in the Corps-funded study. The report uses a template to present a summary of information on the projects. The information summarized includes: planning objectives; recommended plan; cost; water source(s); and public outreach. The main purpose of the study is to showcase projects and examine the "lessons learned." [The Corps funded study: "*Environmental Restoration Projects in Arizona: US Army Corps of Engineers' Approach*" will be accessible in the near future from the University of Arizona website included at the end of this article.]

Wetland Pond, Ed Pastor Kino Environmental Restoration Project
Photo courtesy of Jennifer Jones

The information I presented focused primarily on projects in the Tucson. Ecosystem restoration projects can involve major investments and their development phases often span many years, even decades. Once completed, observable results may take time. Ecosystem restoration projects may be part of multiple-purpose projects and/or other infrastructure projects and usually involve multiple partners. Public input is essential. One of the projects included in the study did not move forward due to local opposition. Finally, vision is important — these projects often result from "outside the box" thinking

Conflicting Uses

URBAN PROJECTS

MULTIPLE USES / MULTIPLE VIEWS

Mike Ellegood, Director of Public Works for Maricopa County (where Phoenix is located and over 50% of Arizona's population reside), discussed his county's interest in promoting multiple-use flood control facilities to protect natural Sonoran desert landscapes. These multiple-uses include open space, recreation and wildlife areas. He illustrated how public infrastructure can be used for environmental purposes, using as an example a site where "volunteer" riparian growth has resulted from urban runoff and wastewater discharges under the intersection of two freeways (see photo below). This habitat has been environmentally resilient. Mr. Ellegood underscored the many challenges associated with ecosystem restoration arising from conflicting resource uses. He noted the importance sand and gravel mining has for development, and advised a partnership approach.

Volunteer Riparian Restoration at Freeway. Photo courtesy of Flood Control District of Maricopa County

Stress Removal

"Water Budget"

Funding

Water Sources

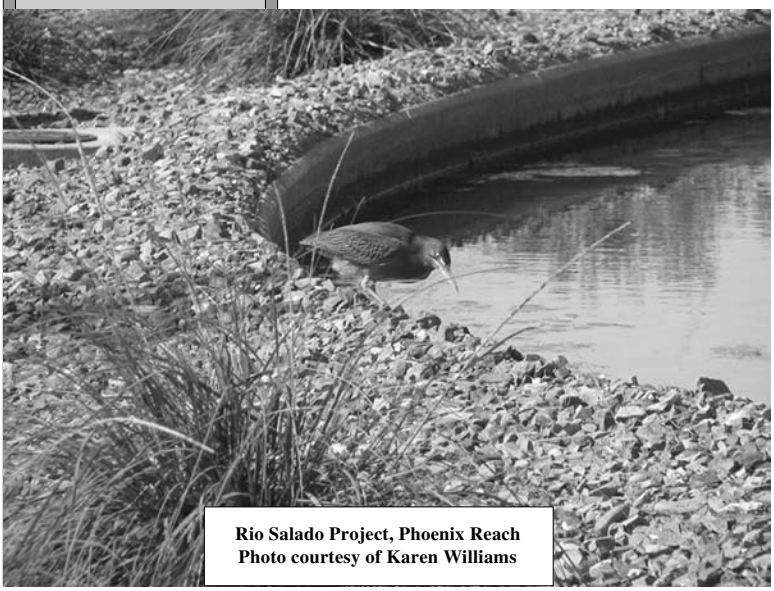
Julia Fonseca, Environmental Program Manager for Pima County Flood Control (Tucson area), has long-term experience with environmental restoration. She also discussed sand and gravel mining, but from a different perspective. Fonseca concentrated on the importance of removing stresses on environmentally sensitive areas, including riverbeds. She outlined the potential for limiting in-channel sand and gravel mining through land buyouts and regulation, with the goal being a more stable river channel. Ms. Fonseca also discussed taking advantage of opportunities. Fire or flood, for example, may lead to the increased willingness of property owners to sell their properties. Lands can then be restored to reduce damage from future drought and fire. Over time, the natural processes can be restored.

Characterizing sustainability as the ultimate "challenge," Fonseca emphasized developing a "natural water budget" as a key component for long-term success. Effluent can play an important role in riparian projects near urban areas, as can stormwater harvesting. Failure to secure a natural water budget and a permanent water supply for sites/projects can result in a lack of sustainability.

Rio Salado Project: Phoenix Reach

A major river/ecosystem restoration project is progressing on different reaches of the Salt River (Rio Salado) despite the lack of voter approval for an earlier concept of this project several years ago. Karen Williams, Rio Salado Project Coordinator for the Phoenix reach, reminded the audience that the Rio Salado Project's concepts were developed by a class at Arizona State University. She explained how program funding developed over several years, pointing out the importance of Corps funding, which covers 65% of the capital costs of construction. The Arizona Water Protection Fund also provided funding for a wetland demonstration project. (The Arizona Water Protection Fund was established in the mid-1990s to provide funding for riparian restoration throughout Arizona. While it received state funding for several years, recent funding by the Arizona legislature has been very limited.)

Ms. Williams stressed the importance of obtaining water (which is "never free") for the project. Phoenix drilled wells in the shallow aquifer so that the withdrawals would not adversely affect the deeper, more pristine, drinking water aquifers. Water delivery canals were lined, in part as the result of a cost/benefit analysis which weighed incidental seepage benefits and delivery efficiency. Re-vegetation of the storm drainage system is providing great benefits at little cost. While some of the 75,000 plants and shrubs being planted will be irrigated to get them established, proximity to the drainage system is expected to maintain them over time. Ms. Williams also emphasized the importance of meeting public expectations with regard to recreational features. Restroom facilities, benches, and education staging areas are all significant components of successful projects.



Rio Salado Project, Phoenix Reach
Photo courtesy of Karen Williams

Ms. Williams noted that this inner-city project — which is to be the site of a new Audubon nature center — has the potential to provide ancillary benefits to distressed areas of the city. The distressed areas to which Ms. Williams referred were also commented upon by author Mark Reisner, who in *The Cadillac Desert: The American West and Its Disappearing Water*, wrote: "Phoenix owes its existence to [the Salt River], but even so it doesn't seem to hold the Salt in high esteem. On both banks, the floodplain is encroached by industrial parks, trailer parks, RV parks, but no real parks. The flood channel itself has been developed to a degree, playing host to establishments which are, by nature, transient: topless bottomless joints, chop shops, cock-fighting emporia. Paris built its great cathedral by its river, Florence its palaces or art; Phoenix seems to have decided that its river is the proper place to relegate its sin." The Rio Salado Project will change the landscape in this now distressed area.

Restoration

Ranch Improvements

Conservation Easements

Springs Source

Native Plants

Tailwater

Dedicated Supply

Drought Plan

Litigation's Role

NON-URBAN ECOSYSTEM RESTORATION PROJECTS

Three speakers shared their experiences with non-urban projects.

Individual Initiative: Improving Property

Jim Crosswhite, Owner/Rancher of EC Bar Ranch, explained what he has been able to accomplish as an individual landowner. His projects have cost $1.6 million, with the required 50% local match coming from his own pocket. He provided examples of types of completed projects, including elk proof fencing, stream channel restoration to reduce turbidity, and irrigation system improvements to establish and maintain growth.

MR. CROSSWHITE OFFERED THE FOLLOWING STEPS TO IMPROVING PROPERTY:

- Implement restoration practices using grant funding
- Maintain sustainable practices which enable taking advantage of a Natural Resource Conservation Service program that involves incentive payments to maintain existing conservation practices
- Provide long-term protection through conservation easements
- Monitor the project to illustrate results

Crosswhite installed a photographic monitoring system. He is currently establishing conservation easements for a three mile stretch of his property. He would like to help others obtain grants and offered people his website (www.ecbarranch.com) or a visit to his ranch for more information. His website is jam-packed with information indicative of his experience and success with obtaining grant funds.

Restoration & Spring Ecosystems

Professor Abe Springer, Northern Arizona University, discussed riparian ecosystems with springs as the primary water contributor. Spring ecosystems, while very important biologically, are also very susceptible to adverse impacts. Sensitive to climate change, they are often ignored in inventories. He covered several Northern Arizona case studies funded by the Arizona Water Protection Fund. Professor Springer's experience has shown that successful projects require multi-disciplinary teams — including students. Team members need to communicate well with each other and with external parties. Agency support is essential to success and good science must be incorporated. He noted that the science "going in" may not seem difficult, but measuring success can be difficult. Recognizing the role of climate and incorporating land management issues are also critical for project success according to Springer.

Riparian Development & Protection

Errol Blackwater (Project Support Coordinator, Gila River Indian Community's Pima-Maricopa Irrigation District) discussed his agency's goal of implementing riparian protection areas. They are developing a native plant nursery to provide native plants to aid riparian restoration. He explained how, while riparian growth has relied mostly on surface water, irrigation tail water ("return flow") has also been used to support the establishment of riparian habitats. The Gila River Indian Community recently received significant Central Arizona Project (CAP) water as part of the largest Indian water settlement on record. They are interested in developing demonstration riparian habitat areas. Blackwater noted that in the past federal agencies cut down cottonwood trees — some 400 years old— to save water. Mr. Blackwater commented on the importance of cultural and recreational opportunities and pointed to the need for dedicated short-term and long-term water supplies. The District's next steps include: setting priorities; translating priorities into research plans; working closely within their Community; and investing in the future environment.

ARIZONA WATER STRATEGY

Alan Stephens, Chief of Staff to Arizona Governor Janet Napolitano, was the keynote luncheon speaker. Governor Napolitano has called for the development of the State's first drought plan and stressed the importance of water conservation throughout the state. The Governor has also asked the State's three universities to assist state water agencies and to collaborate on water resources research, technology development and export, and education.

LAW & ENVIRONMENTAL POLICY

Two attorneys addressed the role of the legal system in effecting environmental policy: Joy Herr-Cardillo of the Center for Law in the Public Interest and CAP attorney Tom McCann.

Ms. Herr-Cardillo led off by noting that courts do not create policy; they implement the policies embodied in law. Like most people, lawyers realize litigation is inefficient. When the law is not being enforced, however, she is glad to have access to the courtroom to ensure that the law is being applied fairly. Arizona's courts have upheld separate treatment of surface water and groundwater. This purely legal disconnect between surface water and groundwater makes it difficult to address certain issues. (Virtually all water resource professionals working in Arizona would generally agree with this

Restoration
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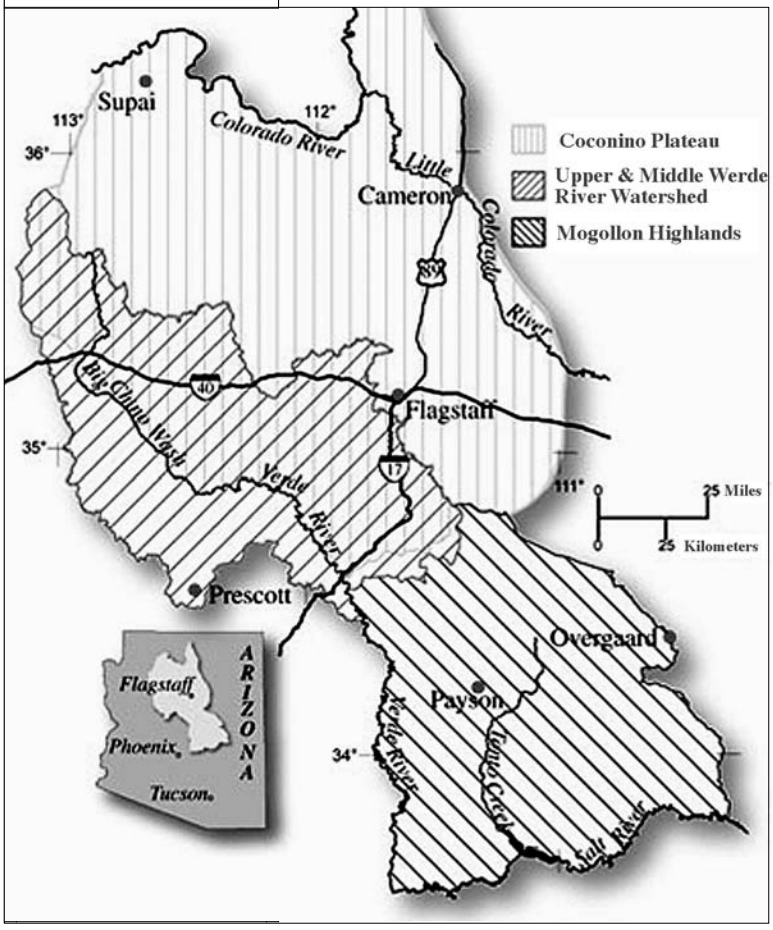
observation.) Under these conditions, what is the alternative to use of the judicial system? Ms. Herr-Cardillo observed that nothing has resulted from the 2001 riparian protection recommendations of Governor Hull's Water Management Commission. Citizen's initiatives are an option – and are popular vehicles for effecting policy in Arizona. She noted that while the legal system may have some problems, it is an integral and indispensable part of our three-pronged system of government.

Mr. McCann stated he agreed generally with Ms. Herr-Cardillo that the legal system plays a crucial role in environmental policy. His presentation noted that courts have frequently thrown out challenges due to deference afforded to the agencies making decisions. He cited the decision of the US Environmental Protection Agency (EPA) regarding the Navajo Generating Plant (concerning Grand Canyon haze), where the Court deferred to the agency to resolve the matter. He noted that when CAP challenged the US Fish and Wildlife service in the 1990s, CAP lost. The Center for Biological Diversity, which sued from the other direction, also lost. It is very difficult to reverse or change a substantive decision of an agency. Where a challenge is successful, it is typically over a process violation, such as failing to consider something deemed necessary under the National Environmental Policy Act (NEPA). Even successful lawsuits rarely change the ultimate outcome; the courts simply correct the process but then come back and reaffirm the original decision. McCann observed that these lawsuits waste tremendous amounts of resources in time and money. He concluded that a collaborative approach is a better use of resources than use of the legal system.

In response to Ms. Herr-Cardillo's statement that the threat of litigation can cause the parties to talk and, thus, litigation is an important part of the toolbox, Mr. McCann acknowledged that things do happen due to a threat of a lawsuit or the lawsuit itself. Attorney Carol Rose, who served as moderator of the panel, noted that a lawsuit may also be a vehicle of public education and that mediation can sometimes assist in resolving complex policy matters.

The panel generated an interesting discussion with some audience members focusing on public input. One person asked how to seriously engage — and listen to — the public. Ms. Herr-Cardillo noted that open houses are held but sometimes there appears to be no real interest in incorporating opposition views. Mr. Ellegood cited the difficulty of getting the public to share their views, unless, that is, a bulldozer appears in their backyards. The challenge of obtaining public input and incorporating it into decision making in a meaningful way was agreed to be an issue requiring attention.



Verde Watershed Area
Courtesy of Kyle Blasch, USGS

VERDE RIVER WATERSHED RESTORATION

Another panel focused on restoration work in the Verde River watershed. The Verde River watershed, north of Phoenix, provides water to the metropolitan Phoenix area through the Salt River Project (one of the first authorized projects built by the US Bureau of Reclamation). This largely rural watershed has a rapidly growing population. Area development is placing increasing demands on groundwater aquifers. There is much debate over water acquisitions and transfers in the area, as well as serious concerns about the region's high-value riparian areas. The region is the subject of much study and restoration activity.

US Geological Survey (USGS) hydrologist Kyle Blasch discussed how ongoing investigations in the Verde watershed are part of a larger effort to understand rural watersheds in Arizona. Development of regional databases, conceptual models, and numerical models is fostering greater understanding of groundwater systems. These efforts support ecosystem work by improving the understanding of: the pre-development hydrologic system; the current hydrologic system; natural variations in hydrologic processes; and anthropogenic changes to the system. They also allow for informed modeling of future scenarios, which is important to planning and understanding the possible impacts of plans. Major issues of concern include water quantity and water quality, and particularly the prevalence of naturally occurring arsenic.

Restoration

Incidental Take

Mitigation Habitat

Large-Scale Approach

Paul Cherrington, Manager of Water Engineering and Transmission for the Salt River Project, spoke about the Roosevelt Habitat Conservation Plan (RHCP). He explained that this plan was the result of federal Endangered Species Act (ESA) protections for the Willow Flycatcher that were associated with water levels at Theodore Roosevelt Dam. The height of the dam was raised in the first half of the 1990s to allow for new storage and flood control space, and to insure dam safety. However, some dry years followed and the water level was not immediately increased. Birds moved into the lower space that had been expected to be under water. An ESA incidental take permit — which allows for harm to an ESA-protected species under stipulated circumstances — therefore became required. A Habitat Conservation Plan (HCP) had to be filed that demonstrated minimization and mitigation of the taking. The incidental take permit, issued after eighteen months, included provisions for four bird species (i.e., Bald Eagle (threatened); Yellow-billed Cuckoo (candidate); Yuma Clapper Rail (endangered) as well as the Willow Flycatcher (endangered)). The RHCP commitments include acquiring 2,250 acres of alternative mitigation habitat (a three-to-one mitigation ratio) and preparing a habitat management plan. One-third of the habitat had to be acquired before the permit was issued. In the Verde area, the 124-acre Camp Verde Riparian Preserve in Camp Verde was purchased. The Salt River Project is working on a baseline environmental inventory at the Preserve and focusing on several associated challenges. Previous activities at the site included recreation (e.g., target-shooting) and livestock use deemed incompatible with mitigation objectives. Old appliances had been dumped at the site and there are adjacent commercial and industrial land uses. The Salt River Project has acquired acreage at five different locations, including land in the Lower San Pedro and the Upper Gila watersheds.

The Nature Convervancy in the Verde River Watershed

The next speaker on the Verde River panel was Pat Graham, Arizona State Director of The Nature Conservancy (TNC). Through the years TNC has recognized that focusing solely on individual preserves is not sufficient, because their preserves are surrounded by a sea of change. The organization now looks beyond individual preserves to a larger scale. This approach is illustrated by TNC's efforts in the Verde River watershed. The Verde River is unique because it is one of the few rivers in Arizona with a year-round flow, and the river's headwaters flow from a large grassland-alluvial basin.

TNC'S EFFORTS IN THE VERDE RIVER WATERSHED ARE BASED ON THREE GOALS:

1) Encourage collective water resource decisions. There are many interests and parties within the Verde River watershed, and TNC is uniquely suited to craft collaborative partnerships and ensure that science is incorporated into decisions.

Verde River
Photo Courtesy of Pat Graham

2) Maintain and restore healthy grassland over the Big Chino aquifer. To achieve this goal, TNC is purchasing development rights and participating in trust land law reform in Arizona.

3) Encourage sustainable water use to meet the needs of both the people and the flow of the Verde River. To achieve this goal, TNC is working to mitigate the export of water from the Big Chino aquifer, limit further depletion of the aquifer and enhance recharge.

Dam Removal

Professor Charles Schlinger of Northern Arizona University (NAU) discussed the Childs-Irving power plant decommissioning and environmental restoration on Fossil Creek. Fossil Creek is an important tributary to the Verde River and contributes 30% of the Verde's flow during the low-flow month of June. The Childs-Irving hydroelectric plant is three miles upstream from the natural confluence of Fossil Creek and the Verde River. In March 2005, the Federal Energy Regulatory Commission provided final approval to decommission the Childs-Irving Plant. Decommissioning the dam will restore Fossil Creek's 46 cubic feet per second base flow and the fourth largest travertine (i.e., limestone-forming) system in North America. This ecosystem restoration effort also affords a unique opportunity to restore native fish to the system. The US Bureau of Reclamation has installed a fish barrier to keep non-native fish from Fossil Creek and all non-natives have been removed. Once the dams have been decommissioned and flow restored, NAU will research how the system recovers, focusing on travertine development, aquatic species interaction, sediment research and monitoring, recreation and visitor impacts, and stream-flow gauging.

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LOWER COLORADO MULTISPECIES CONSERVATION PROGRAM

The next panel focused on the Lower Colorado Multispecies Conservation Program (LCMSCP). Recently finalized, the LCMSCP will be the focus of much investment and extensive monitoring.

The context for the LCMSCP was provided by Bill Werner, Arizona Department of Water Resources, who noted that although Salt River Project's reservoirs have risen considerably, the major storage reservoirs on the Colorado River (i.e., Lake Powell and Lake Meade) still remain at levels far below that prior to the beginning of the drought.

Dams' Impact

Perri Benemelis, Arizona Department of Water Resources, discussed the competing demands for Colorado River water. She remarked that the Colorado River is substantially over-allocated. The presence of dams on the river has altered the channel forming processes and the natural regeneration of riparian habitats along the River. The restoration efforts along the Colorado River are driven by compliance with the National Environmental Policy and the Endangered Species Acts. The LCMSCP is not a recovery-based program. Its goal is to offset the adverse effects of water diversion. Developing the LCMSCP was an arduous process, taking ten years to get through the planning phase. It is estimated that program implementation will cost $630 million over 50 years.

Multi-Species Conservation

Chris Harris, Administrator for the LCMSCP, addressed the challenges and opportunities for restoration along the Lower Colorado River. There are 26 species covered by the multispecies conservation plan, including species from aquatic, marsh, and riparian habitats. He noted that unlike the restoration opportunities in an area such as Fossil Creek where the dam will be removed, it is not feasible to remove the dams along the Colorado River. The challenge of restoration on the Colorado is to see what can be done within the given constraints. The most pressing problems are managing non-native species, such as salt cedar, and controlling wildfires. The management of the restored areas will be dynamic and adaptive. Monitoring and research from one year will be incorporated into the subsequent year's plan. LCMSCP personnel have identified 35,000 acres of habitat with high restoration potential. Finally, Harris noted that throughout the process there have been tensions as well as collaboration among the many diverse groups involved in the LCMSCP.

Removing Non-Native Species

The Colorado River Delta Project

Dr. Francisco Zamora Arroyo, Project Manager for the Colorado River Delta Project at The Sonoran Institute, spoke on activities taking place south of the border. Although the Mexican delta is not a part of the LCMSCP, there are many restoration opportunities there. The Sonoran Institute has developed a map of the possible restoration activities in the Delta, while recognizing that restoration to historic levels is not possible. They have identified 264,438 acres for protection and 594,958 acres for restoration within the Delta. The overarching problem that they face is a lack of secure water flows. Each of the sub-ecosystems within the Delta, however, has distinct attributes and priorities. The El Tapon Project area (see picture below) includes a series of check dams. In several areas, control of salt cedars is a concern. The restoration of many areas in the Delta is driven by a desire to use it for ecotourism. In moving forward with these projects, Project personnel have identified the need for a comprehensive restoration strategy and plan, as well as the need for the Mexican government to designate the area as a Restoration Zone. He concluded by indicating that restoring key areas of the Delta will be hard to achieve until the governments of the United States and Mexico increase their commitment to improving and repairing the health of these ecosystems.

Mexican Delta

El Tapon Project Area, Mexico. Photo courtesy of AEURHYC, A.C. & Francisco Zamora Arroyo

Restoration

Shrinking Finances

Effort = Progress

FUNDING

The final panel of the day addressed funding opportunities. Ecosystem restoration requires substantial financial backing, often from multiple sources. Representatives from the Arizona Water Protection Fund, the US Army Corps of Engineers, the Arizona Department of Environmental Quality and the Natural Resource Conservation Service spoke. While noting funding opportunities, all cited needs that exceeded available and sometimes shrinking resources. David McKay, who recently became Arizona's State Conservationist, noted the importance of increasing funding for watershed planning.

CONCLUSION

In retrospect, ending the conference with a discussion related to funding seems fitting . However pressing the impetus for ecosystem restoration, the costs can be considerable. Nevertheless, individuals and agencies should not be dissuaded. Although the efforts take considerable time, the conference clearly left me optimistic. Regardless of project size, the various presentations demonstrated that substantial progress in project development, implementation and assessment is being made. Although collaboration can be difficult, it will ultimately lead to greater success in developing viable projects and securing funding. Environmental considerations, perhaps once the stepchild of public works and other projects, are now in the foreground.

For Additional Information: SHARON B. MEGDAL, University of Arizona, 520/ 792-9591 x21 or email: smegdal@ag.arizona.edu

CONFERENCE WEBSITE: the conference agenda and presentations, where available, can be found at www.cals.arizona.edu/azwater/.

Sharon B. Megdal, PhD is Director of the Water Resources Research Center (WRRC) and Professor in the Department of Agricultural and Resource Economics at the University of Arizona. Dr. Megdal's work focuses on state and regional water resources management and policy. She is a frequent lecturer and writes a water policy column for the WRRC's bi-monthly newsletter, *The Arizona Water Resource*. Megdal holds PhD and MA degrees in Economics from Princeton University, where she specialized in public sector economics and econometrics, and an AB degree in Economics from Douglass College of Rutgers University, where she was Phi Beta Kappa. She has served on numerous state boards and commissions, including the Water Quality Appeals Board and the Governor's Water Management Commission. She thanks Kelly Mott Lacroix, Chris James and Jackie Moxley for assistance in preparing this article. Special thanks go to all the speakers at the conference.

2005 SEDIMENTS CONFERENCE

by Laura Kennedy, Kennedy/Jenks Consultants (San Francisco)

Sediments

EPA Perspective

The Environmental Law Education Center Sediment Conference, which was held on May 6, 2005 in Portland, Oregon provided perspectives on the legal, technical, and policy issues associated with cleaning up contaminated sediment sites.

Keynote Speaker: Integrated Approach

Eric Stern, the Regional Contaminated Sediment Program Manager for US Environmental Protection Agency (EPA) Region 2 (New York), specializes in contaminated sediments and provided the keynote address for the conference. Mr. Stern discussed some of the difficulties of characterizing and remediating contaminated sediment sites, such as the inability to see the extent of the entire problem, the complicated physical system and contaminant exposure pathways, and the complex sediment management paradigms used by various federal and state agencies. Sediments do not fit neatly within agency structures as there are many cross-program applications, such as the Comprehensive Environmental Response Compensation and Liability Act (CERCLA or Superfund), the Clean Water Act, and Dredged Materials Management.

Mr. Stern advocated for an integrated approach to contaminated sediment management. He discussed the need to develop long-term self-sustaining enterprises in the environmental management of sediments by recognizing that sediment management is ultimately a business. Because sediments are a non-renewable resource, the management of sediments needs to be sustainable. Sediments can be processed with mixed feeds to sustain long-term business models, maximize beneficial uses, and reduce demand for non-renewable resources, while providing a sustainable use of contaminated sediments. Examples of sustainable sediment uses include cement-lock, BioGenesis sediment washing, and renewable confined disposal facilities.

[FOR MORE INFORMATION about reinventing sediment management, contact Mr. Stern: 212/ 637-3806]

Sediments

Oregon Program

"RSET"

Screening Levels

Bio-Accumulation

Sediment Assessment and Evaluation

UPDATE ON OREGON'S PROGRAMS

Keith Johnson, who manages the Lower Willamette Clean Up section for the Oregon Department of Environmental Quality (ODEQ) in their Northwestern Region office, discussed ODEQ's priorities and directions for 2005 related to sediment assessment and management.

Mr. Johnson said that sediment assessment and management is essentially about risk assessment and management. Risk assessment and management require early and frequent communication, development of a conceptual site model to assist in problem formulation, early involvement of toxicologists, agreement on investigation goals and how the resultant information will be used, considering action instead of continuous investigation, and early feasibility study considerations. Management decisions come down to managing uncertainty. ODEQ recognizes the uniqueness of sites and attempts to make reasonable decisions based on precedent and agency goals. Ultimately, ODEQ errs on the side of conservatism when managing uncertainty.

ODEQ IS CURRENTLY WORKING ON THE FOLLOWING SEDIMENT ISSUES:

- Population rule for ecological risk assessment and how it should be applied to sediment sites
- Consideration of spatial scale (i.e., locality of facility, local population)
- Bioaccumulation
- Freshwater screening values
- Consideration of anthropogenic or "ambient" background concentration of constituents

In 2005, ODEQ will continue the Clearinghouse/Peer Group discussions and focus on site-specific decisions. ODEQ is working on developing bioaccumulation guidance and is planning to update freshwater screening values. This work is tied to the efforts of the Regional Sediment Evaluation Team (RSET). ODEQ will continue discussions with stakeholders and Technical Advisory Panel, as appropriate.

Mr. Johnson discussed how the Portland Harbor project is providing a basic framework for sediment characterization. The data generated by the Portland Harbor project will be used by ODEQ in developing sediment guidance, and seasoned ODEQ resources are providing input to the Portland Harbor project. [FOR MORE INFORMATION about ODEQ's process for sediment assessment and management, contact Mr. Johnson: 503/ 229-6431]

EVALUATING CONTAMINATED SEDIMENT

Taku Fuji, a senior toxicologist and sediment quality specialist at Kennedy/Jenks Consultants (Portland, Oregon), provided an overview of RSET and how it is evaluating contaminated sediments. RSET is a multi-agency group that was formed to revise the existing regional Dredged Material Evaluation Framework into the Sediment Evaluation Framework (SEF) for use by all Northwest US Army Corps Districts, US EPA Region 10, NMFS, USFWS, and other federal and state agencies that require sediment quality evaluation procedures.

Dr. Fuji discussed the sediment quality screening levels being developed by RSET. Both freshwater and marine sediment levels are being developed for direct toxicity. The freshwater sediment screening levels are based on the floating percentile method. Field validation efforts are scheduled for 2004/2005. The Puget Sound Dredge Disposal Analysis (PSDDA) screening levels and Washington State Department of Ecology's Sediment Management Standards are being proposed for the marine/estuarine sediment screening levels.

RSET has also developed a bioaccumulation framework for the SEF to address bioaccumulation issues.

THE BIOACCUMULATION FRAMEWORK IS AS FOLLOWS:

- Identify **b**ioaccumulation **c**hemicals **o**f **c**oncern (BCOCs), which may be generic or watershed-specific
- Establish a "reason to believe" using project-specific chemistry data and existing watershed tissue data
- Tier 1 – Compare sediment data to sediment **b**ioaccumulation **t**riggers (BTs) or watershed BCOCs
- Tier 2 – Conduct bioaccumulation testing or tissue collection

Dr. Fuji described some of the challenges facing RSET. Bioaccumulation challenges include refining the definition of "reason to believe," the time required to develop **t**arget **t**issue **l**evels (TTLs), back-calculating defensible sediment BTs, integrating cleanup and dredging efforts, filling data gaps, and funding the development of TTLs and BTs. Chemical analyte issues, such as PCB analytical methods for sediment and tissue, modern pesticide data, and procedures to add or drop analytes, are also issues for RSET.

Sediments

Dr. Fuji summarized the future of RSET. There is a strong desire to keep the process moving and technical subcommittees will continue their work. RSET will monitor regional and national sediment quality efforts and there will be outreach to the public, Oregon and Idaho resource agencies, tribes, and stakeholders. A public meeting about the draft SEF is anticipated in September 2005.
[For more information about RSET or sediment evaluation, contact Dr. Fuji: 503/ 295-4911]

Liability

Allocation of Liability

Allocation Factors

"PRPs"

Joan Snyder, a partner in the Environmental Practice Group of Stoel Rives LLP (Portland, Oregon), discussed the allocation of liability at sediment cleanup sites. She described the causes of action and how courts assign liability. Four categories of liable parties and three causes of action exist under Federal Superfund (CERCLA, 42 USC §9601 et seq.) . Causes of action include: a pure cost recovery claim on a joint and several liability basis available to US government, state, tribes, or innocent parties under §107(a); an implied right of contribution claim for non-innocent **p**otentially **r**esponsible **p**arties (PRPs) under §107; and a contribution action for non-innocent PRPs under §113. In its recent *Aviall* decision, the US Supreme Court limited the circumstances under which a §113 cause of action is available and raised as a question for remand whether a cause of action is available under §107(a) to a non-innocent PRP. *Cooper Industries, Inc. v. Aviall Services, Inc.*, 543 US __, 125 S Ct 577, 160 L Ed 2d 548 (2004).

Ms. Snyder discussed the allocation factors used by Federal courts and under Oregon Environmental Cleanup Law. Ms. Snyder also described the difficulties in the application of allocation factors to river/ sediment sites. For example, the investigation and assessment costs are not a function of the amount or toxicity of sediments. At multi-contaminant sites, secondary risk drivers may be present that would have driven risk if not for the primary risk drivers. In general, there is a lack of case law regarding allocation of liability in urban river systems, especially for multi-contaminant sites.
[For more information about allocation of liability, contact Ms. Snyder: 503/ 294-9657]

Alternative Dispute Resolution for Sediment Sites

"ADR"

William Hengemihle of LECG, LLC (Wayne, Pennsylvania) provides cost allocation and dispute resolution services to individual PRPs and PRP groups at Superfund sites. He discussed **a**lternative **d**ispute **r**esolution (ADR) at sediment sites and provided a case study of the Thea Foss Waterway at Commencement Bay in Tacoma, Washington.

PRP-Lead

Mr. Hengemihle defined ADR as any means for resolving conflicts other than litigation, such as arbitration or mediation. He recommends ADR for sediment sites because sediment cases defy the conventional litigation approach. ADR can induce early PRP-lead work, foster an orderly and fair resolution of allocation conflicts, focus on "getting to yes," reward cooperation, and is a win-win for all stakeholders. The basic ADR model involves convening the allocation participants and then conducting the allocation process, with the typical outcome of performing party settlements and buyout party settlements. The primary allocation factor under ADR is cost causation, which is to say that activities that cause costs should bear the costs.

Cost Assignment

Mr. Hengemihle described the typical urban river allocation approach in which cost factors are assigned to sediment management areas for both investigation and remedy. The costs are then split between the bank and bedland owner/operator share and the upland parcel share. The upland parcel share is further divided by inter-parcel allocations and then intra-parcel allocations.

Some of the ADR challenges and opportunities identified by Mr. Hengemihle include the need for federal "seed money," allocation process incentives, federal PRP participation, and agency side dealings.
[For more information about ADR at sediment sites, contact Mr. Hengemihle: 610/ 254-4040]

Scientific Approaches to Allocating Liability

Lucinda Jacobs, environmental scientist with Integral Consulting (Mercer Island, WA), specializes in aquatic and sediment geochemistry, processes that mitigate exposure to toxic chemicals, and processes that control chemical transport and fate. Dr. Jacobs discussed scientific approaches to allocation liability.

Tools

Dr. Jacobs presented the strategy for scientific allocation of liability as selecting the technical team, evaluating existing data in context of the project goals, selecting tools and knowing their limitations, using multiple independent lines of evidence, and corroborating the results. Tools to support scientific allocation of liability include historical reconstruction, source identification, transport modeling/ reconstruction, chemical fingerprinting, causation/effects, and communication.

Dr. Jacobs provided several case studies demonstrating scientific approaches to allocating liability. In one case, transport modeling was used to show how metals were impacting groundwater. In another case, she discussed how focusing on PAHs (polynuclear aromatic hydrocarbons) rather than TPH (total

Sediments

petroleum hydrocarbons) as the primary chemical of concern changed the source allocation and also cautioned on the interpretation of toxicity tests. Dr. Jacobs also described a case in which chemometric techniques were used to evaluate relationships between sediment and fish tissue concentrations and ultimately showed that sediment remediation was unlikely to reduce risk.
[For more information about scientific allocation of liability, contact Dr. Jacobs: 206/ 230-9600]

Early Action

Pre-"ROD"

Early Action Processes

Patricia Dost, an attorney with Schwabe, Williamson & Wyatt (Portland, Oregon), discussed early action processes under Superfund. As defined by Ms. Dost, an early action is any cleanup that is scheduled or takes place before the Record of Decision (ROD), which means that the cleanup decision and removal action occurs before the **r**emedial **i**nvestigation/**f**easibility **s**tudy (RI/FS) is complete.

"EE/CA"

Ms. Dost described three types of early removal actions: emergency actions, time critical actions, and non-time critical actions. For non-time critical actions, an **e**ngineering **e**valuation/**c**ost **a**nalysis (EE/CA) is done. The EE/CA is like a streamlined RI/FS and typically involves assumptions or surrogates due to incompleteness of data. An Action Memorandum documents the remedial action.

Ms. Dost talked about reasons for performing an early removal action, such as accelerating cleanup, providing source control so that a remedy can be implemented at the time of the ROD, minimizing the extent of cleanup and preventing the spread of contamination, accelerating a business transaction, or removing risk to public health and the environment. While there are many reasons for performing an early action, Ms. Dost also discussed some of the concerns with early actions, such as the difficulty in making good decisions in advance of the risk assessment, the need for additional actions if assumptions are insufficiently conservative, implementing costly actions if assumptions are too conservative, possibly focusing on the wrong chemicals, or the potential for recontamination.
[For more information about early actions at Superfund sites, contact Ms. Dost: 503/ 796-2449]

Duwamish Early Actions

Early Action Sites on the Duwamish

Betsy Day, a Principal Scientist at Integral Consulting (Mercer Island, Washington), discussed early actions on the Lower Duwamish Superfund site in Seattle. She began by describing the method used to select sites for early action and identified the seven early action sites that were proposed based on the site selection method. Her presentation focused on two of the early action sites: Slip 4 and Terminal 117.

The Slip 4 Early Action Area includes 5.7 acres and numerous outfalls. The area was proposed as an early action site due to elevated PCB concentrations in sediment. The proposed removal action boundary is based on historical exceedances of sediment quality standards. The challenges facing the Slip 4 Early Action are the ownership of the cleanup area, which is not owned by the funding parties, and source control.

The Terminal 117 Early Action Area was also proposed as an early action site due to elevated PCB concentrations in sediment. An uplands removal action was previously performed that involved excavation and capping. The proposed early action is excavation and replacement of sediment exceeding sediment quality standards. The challenges facing the Terminal 117 Early Action are the maintenance dredging of an adjacent marina and integration with the previous upland removal action.
[For more information about early actions on the Duwamish, contact Ms. Day: 206/ 230-9600]

Portland Early Actions

Portland Harbor Early Action Case Study

Anne Summers with the Port of Portland presented the status of the Terminal 4 Early Action for Portland Harbor. The Terminal 4 Early Action is currently in the process of developing the EE/CA, which should be available for public comment in June 2005. Prior to developing the EE/CA, sampling and analysis was conducted to collect data needed to complete the engineering design.

After considering EPA evaluation criteria, Terminal 4 Marine Operations, engineering and technical feasibility, and public feedback, four cleanup alternatives were identified. These alternatives involve monitored natural recovery, capping, and dredging. Alternative A has an emphasis on monitored natural recovery, Alternative B has an emphasis on capping, Alternative C has an emphasis on dredging with confined disposal facility, and Alternative D has an emphasis on dredging with upland landfill disposal.

Using the EPA evaluation criteria, Alternative C ranks the highest, followed by Alternatives A, B, and D. Alternative C is protective of human health and the environment and contributes to overall Portland Harbor cleanup. Alternative C also ranked highest in terms of effectiveness and implementability, and the cost is within the range of the other options.
[For more information about the Terminal 4 Early Action, contact Ms. Summers: 503/ 944-7508]

Sediments

Early Action Phases

Source Control Goals

Investigation & Sampling

Upland Sources

Updates on the Duwamish and Portland Harbor Superfund Sites

DUWAMISH SUPERFUND SITE UPDATE

Allison Hiltner, a Remedial Project Manager with EPA Region 10 (Seattle, Washington), provided an update on the Lower Duwamish Waterway Superfund Site. Ms. Hiltner began by comparing and contrasting the physical characteristics of the Lower Duwamish site versus the Portland Harbor site such as size, flow, and water body type. The Phase 1 Remedial Investigation and Risk Assessments were completed for the Duwamish in July 2004. The Phase 1 results were used to provide a preliminary assessment of site risks, identify potential early action cleanup areas, and identify data gaps. Seven early action areas have been proposed. Phase 2 sampling started in summer 2003 and will be completed in early 2006. The Phase 2 sampling includes surface and subsurface sediments, benthic invertebrate, clam, crab, and fish tissue, porewater and seeps, and sediment transport study. The draft Phase 2 Human Health and Ecological Risk Assessments are scheduled for fall 2006, the draft Phase 2 Remedial Investigation Report is scheduled for summer 2007, and the draft Feasibility Study is scheduled for winter 2007, with the proposed cleanup plan anticipated in 2008.
[FOR MORE INFORMATION about the Lower Duwamish Superfund site, contact Ms. Hiltner: 206/ 553-2140]

DUWAMISH SOURCE CONTROL

Rick Huey with the Washington State Department of Ecology's (Ecology's) Northwest Regional Office (Bellevue, Washington) discussed source control on the Lower Duwamish. Mr. Huey also began by comparing and contrasting the Lower Duwamish drainage basin versus the Portland Harbor drainage basin. The Source Control Strategy was jointly written by Ecology, King County, City of Seattle, City of Tukwila, Port of Seattle, and EPA. The source control goals are to minimize the potential for chemicals in sediments to exceed sediment standards or cleanup goals, to allow sediment cleanups to begin, to increase opportunities for natural recovery of sediments, and to support long-term suitability and success of current and future habitat restoration opportunities. The source control approach is to focus on individual drainages for Early Action Areas, to develop source control action plans for each Early Action Area, and to implement the plans. Source control is currently underway through the City of Seattle/King County Joint Business Inspection Program.
[FOR MORE INFORMATION about Lower Duwamish source control, contact Mr. Huey: 425/ 649-7256]

PORTLAND HARBOR SUPERFUND SITE UPDATE

Chip Humphrey, a Remedial Project Manager with EPA Region 10 (Portland, Oregon), provided an update on the Portland Harbor Superfund Site. Mr. Humphrey provided the background of the Portland Harbor site and described work done to date. Round 1 Remedial Investigation work was done in 2002 and included physical system characterization, fish tissue sampling, and sediment sampling. Metals detected in fish were relatively low. Some fish were found to have high organic contamination loads while other fish were found to have lower organic contamination loads. Round 2 includes sediment sampling, surface water sampling, beach sampling, and groundwater pathway sampling. Fieldwork conducted in 2005 will be used to fill data gaps. Three early actions, Port of Portland T4, Gasco, and Arkema, are underway or being negotiated. The next steps are to evaluate Round 2 data, investigate groundwater pathways, identify data gaps, develop Round 3 sampling plans, plug data into the risk assessment, and begin looking at cleanup options.
[FOR MORE INFORMATION about the Portland Harbor Superfund site, contact Mr. Humphrey: 503/ 326-2678]

PORTLAND HARBOR SOURCE CONTROL

Jim Anderson, the ODEQ Portland Harbor Section Manager, discussed upland source control on Portland Harbor. The goal of upland source control is to identify and eliminate or control upland sources of contamination threatening the river and river sediments. The source control strategy is being developed jointly by ODEQ and EPA and establishes the regulatory and technical framework for controlling ongoing upland sources of contamination threatening the river. The source control process involves site characterization, identification of potentially complete contaminant transport pathways, use of conservative screening levels to screen upland sources, prioritization of sources based on screening, and taking appropriate action based on priority. Mr. Anderson discussed the screening levels that are proposed for soil and catch basin sediment, and groundwater and stormwater. The final draft of the Joint Source Control Strategy is due to EPA and its partners June 2005 with public comment in July 2005.
[FOR MORE INFORMATION about Portland Harbor source control, contact Mr. Anderson: 503/ 229-6825]

Laura Kennedy is a project manager and risk assessor for Kennedy/ Jenks Consultants in the Industrial Services Group in San Francisco. Ms. Kennedy is an environmental scientist with more than 9 years of consulting experience that includes environmental investigation/ remediation, regulatory permitting/compliance, and specialized experience in human health and ecological risk assessment and risk management.

PORTLAND HARBOR SUPERFUND SITE UPDATE, CONTINUED

Jim McKenna from the Port of Portland and co-chair of the Lower Willamette Group (LWG) provided an update of Portland Harbor activities. Mr. McKenna discussed the history of the Willamette River and the economic significance of Portland Harbor in the region, as well as the impacts that the Superfund listing have had on Portland Harbor. The LWG was formed in March of 2001 and includes 10 members who signed an Administrative Order on Consent with EPA. The goals of the LWG are to work toward an expedited cleanup, prepare a technically and legally sound RI/FS, let science guide the process, work closely with EPA and its partners, and involve the public. To date, the LWG has collected numerous sediment and fish tissue samples, as well as surface water and physical system samples as part of the RI/FS. The LWG is working with EPA in a search for additional PRPs.
[FOR MORE INFORMATION about the LWG and its work on Portland Harbor, contact Mr. McKenna: 503/ 944-7325]

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Water Planning

Status

Opportunities

Foresight v. Risk

WATER USE & TRANSFERS

SYSTEMATIC PLANNING AVOIDS RISKS - CREATES OPPORTUNITY

by Douglas MacDougal, Schwabe Williamson & Wyatt

Throughout the West, similar conditions with regard to water use management are giving rise to similar concerns. These concerns will only become more pressing, even urgent, over time. This article, which is based in part upon a March 30, 2005 presentation at a conference in Salem, Oregon, titled "Water Rights Sales and Transfers in Oregon," outlines the wisdom of spending the time, effort and money to integrate all of these concerns into a unified, comprehensive water use management plan.

Concerns & Questions

Let's assume that you are either a water user with significant water rights, or that you represent such a user. You may be an entity that provides water to tenants, or individual consumers, or to farmers (through your irrigation district). Or you may be a port or municipality doing some or all of these functions. Let us assume that many people depend on your water rights, or use or consume the products you produce with your water. You obtain water from groundwater or surface water or a mixture of both. Like many water right holders, you are not using the full extent of your water rights. In some areas you may be using more water than you ought. There is need for future growth in some places. Others may be phasing out. There may be contamination issues affecting some of your wells. Perhaps some surface water points of diversion need fish screens or fish passage improvements. Perhaps there is an issue of waste in your conveyance system or inefficient methods of use.

The questions you face are also confronting many others: Will there be enough water to accommodate anticipated growth? Can that growth be met by implementing conservation measures over time? Or do you need to acquire new water rights? Is there unused water in danger of forfeiture?

What about third-party opportunities? If someone approaches you with a water right acquisition offer, should that offer be accepted and at what price? If you have excess water, should you try to market that water? These issues are intimately tied up with the water planning questions noted above, and have economic impacts. Water markets are emerging throughout the West, and anyone ignoring either the opportunities for acquiring needed water rights, or selling unneeded rights, is fostering unnecessary risk.

We have had encounters with clients where a little planning a few years earlier could have salvaged now lost water rights. We have seen water marketing opportunities missed for want of foresight. Assuming you do not want this to happen, and desire to engage in the planning effort, we suggest beginning the planning process by establishing goals. Goals will need to be tailored to the specific enterprise in question. Yet there are certain common features of master planning for water use, and certain goals that will likely emerge from them. We propose that a basic master plan should at a minimum contain five key components from which objectives strategies for implementation can be developed. The first two goals are crucial: planning and preservation. We will focus primarily on those two goals here, since they are the most fundamental. We will also touch briefly upon three other goals: control, coordination, and acquisition/transfer.

Water Planning

Systematic Review

Anticipating the Process

Water Audit

Matching Future Needs

Reasonable Projections

Management & Conservation

Planning

DEFINE FUTURE WATER NEEDS - DEVELOP A PHASING PLAN

Many people regard their water rights in somewhat simplistic terms. They see only that they have water rights in a specific quantity for certain uses, with particular limitations. The actual water right permits or certificates are seldom examined. If more water is apparently needed, obtaining new water rights is apparently the solution. Rarely is there a systematic review of what specific water rights are actually held and how those rights match up with future needs. We have encountered situations where there was a concern about how to obtain new water rights. After embarking on systematic water master planning, however, it turned out that the problems were not ones of shortage but of excess. Thereafter, efforts became properly focused on marketing those excess rights rather than trying to obtain new rights.

Systematic planning accomplishes several important goals. First, if any new water permitting or transfers are required, the Oregon Water Resources Department does not process applications quickly. Long lead times are required. Similar problems exist with many of the other western states' water agencies. This easily anticipated delay mandates foresight and planning. Second, if you are negotiating for the transfer of water rights for instream leasing, or for use on lands leased to others, you will need to know how much water can be set aside, and when increments of water from what sources need to be *released back* for use. This is the concept of "phasing" water availability, analogous to preparing a series of bonds or treasury certificates that one has staggered so that they mature at different times to meet anticipated future needs. Third, if other water rights — or other lands which may need water rights — are to be acquired (or leased), long lead times are again advisable in order that these acquisitions may be valued, negotiated and in place for use when needed. Finally, if it turns out that the aggregate of your water rights at any time is insufficient to meet future needs, then advance planning is essential to address that concern. The purpose of this goal is for you to be ahead of the curve on all these aspects.

The foregoing suggests the necessity at the outset to identify not only future water needs but also what sources and rights will be in position to meet those needs. This implies a critical audit of one's own water rights, something many entities have yet to do. Evaluation should include not only a legal but also a physical audit of one's water rights and actual (and historic) uses. The result will be an inventory of rights and a list of problems or issues that may need to be addressed. The amount of water actually available for use or transfer may be significantly different than anticipated.

The next step is to match the inventory of usable rights with expected future requirements. Determining one's future water needs is usually a game of estimation. In the case of municipalities, there are well-established techniques (with which many consultants are familiar) for making population growth projections. In other types of situations, it may be more difficult to predict future need. There may be a need for water in a future industrial or commercial park, but the tenant mix of the land may not now be known. Hence, it will be guesswork to predict how much water future tenants may consume. There may be a long-term hoped-for development — such as a shipyard, power plant, or casino — which could potentially use a large volume of water, but the likelihood of it being constructed will be guesswork. For some irrigation districts, the question may be how to gauge the rate of urban encroachment onto district lands. Should steps be taken now to plan what to do with water that will eventually no longer be needed for irrigation? Should the owners of selected lands be approached now? For many users, water uses may be static in the foreseeable future. But even in that situation, the question arises whether planned or possible conservation efforts will free up water for future transfer. Will water unused become subject to forfeiture if nothing is done?

The idea of planning future water needs fits squarely within the underlying concept of the recent revisions to Oregon's Division 86 rules, "Water Management and Conservation Plans" (see Oregon Administrative Rules, Chapter 690, at the Oregon Water Resources Department website: www.wrd.state.or.us/OWRD/LAW/oar.shtml). These rules require Water Management and Conservation Plans as a condition to use of water under "extended" water use permits (permits from the state for water rights where an extension is requested to allow for development of the right beyond the time period originally required). For example, these rules require municipalities to justify long-term water needs according to specified criteria before water can actually be used under extended permits. Forcing an entity to plan water use avoids the alternative of tying up more water than might reasonably be needed. Planning future water use is the key component and any water conservation strategy.

Nowadays, planning should include specific steps to deal with drought. Naturally, if there are imbalances between supply and demand in any business, good planning can alleviate or smooth out the bumps. There are a variety of tools that can be employed specifically for drought planning. These tools should be known and at hand if drought is approaching.

Water Planning

Preservation

PRESERVING WATER RIGHTS TO MEET FUTURE NEEDS

MINIMIZE RISK OF UNANTICIPATED LOSSES

Preservation of one's water right means taking all necessary steps to maintain full use of those rights in the future. Preservation includes being sure permit schedules are on track, permit conditions are being met, and that extensions of time have been timely sought. The two principal (though not the only) ways in which rights to the use of water can be compromised or lost are through forfeiture under state law, or through non-compliance with the federal Endangered Species Act.

Assessment

Very few people do an actual risk assessment of not only their water rights, but also the use they are making of those rights. The risk assessment suggests identifying areas where the water right is either subject to risk or is creating a risk of liability. A systematic review of all of one's uses and cataloging of risks is then followed by a prioritization of those risks and the creation of steps needed to address them. This is but one component of the overall master plan, but it is a critical and useful one.

Non-Use

At the state level, non-use of water is the most common means of losing or at least compromising one's water right. In Oregon, as in other western states, water rights can be lost through non-use. Often overlooked by water users is the need to take active steps to monitor water use and find ways of using water to prevent it from being lost through forfeiture. With fierce competition for water no doubt increasing in the future, there will be even greater emphasis by state water agencies (or agency response to forfeiture complaints/affidavits from others) on enforcing forfeitures. Water users should pay particular attention to the process within their state regarding the initiation of forfeiture proceedings (an explanation of Oregon's forfeiture process can be found online at www.wrd.state.or.us/OWRD/PUBS/aquabook_canceling.shtml; see also ORS 540.610 et. seq. at www.wrd.state.or.us/OWRD/LAW/docs/WaterLawsVol1.pdf).

Transfer Process

Even if one has not actually been subject to a forfeiture proceeding, one can become presumptively at risk of forfeiture under ORS 540.610 and that fact may impair the ability to transfer the water right, or to market the property to which the right is appurtenant. This is because during the water right transfer process, the Oregon Water Resources Department is required to ascertain the extent of the use of the water being transferred. The extent of historic water use is a standard question asked by any competent buyer doing due diligence on property where the water rights are important to the use of the property (and lender). Even if a buyer does not ask this question, it is commonly included within the seller's warranties that are made to the buyer. So if one is truly interested in preserving one's water right, one will make use of that right and keep records of quantities of water used. The unused water should be considered for in-stream leasing purposes to prevent the forfeiture period from running on the unused water. If the unused water is the result of conservation activities, one could also consider entering into an "Allocation of Conserved Water" program to preserve the benefits of the unused water (see Oregon Administrative Rules, Division 18 for the rules regarding water conservation).

Historic Use Records

Conservation Benefits

Conservation activities typically free up enormous quantities of water. Sometimes this happens rather rapidly with the piping of canals or the conversion from flood or other inefficient irrigation techniques to sprinkler or drip irrigation. This can occur through the repair of leaks, the use of water-conserving plumbing fixtures, or improved efficiency of existing equipment. Sometimes merely changing a point of diversion or point of appropriation can eliminate miles of leaking and costly-to-maintain delivery systems. Whether water conserved should be forfeited for non-use or actually planned for and transferred to more productive uses is a question that many people fail to ask. As a result, tens of thousands of acre-feet of water in the state become subject to forfeiture and essentially non-transferable.

Physical Capacity

A water user may also no longer have the physical capacity to divert, convey or use all of their water rights. This can happen, for example, in a change of irrigation systems instituted to conserve water. In addition to removing a defense to forfeiture under ORS 540.610(3), the inability to actually convey the full amount of the water to the places of use becomes strong physical evidence that the water is no longer beneficially used to the full extent of the right. The absence of such ability will impair transfer whether or not the right has been forfeited. See OAR 690-380-4010(2)(b).

ESA Risks

The goal of preservation also entails preventing loss of your water rights or assets as a result of violations of the federal Endangered Species Act (ESA), the federal Clean Water Act, or state law. If there is a risk of shutdown of a diversion due to risk of "take" (generally, avoidable harm to a protected species) under Section 9 of the ESA or, because of inadequate fish passage or fish screening, or even dewatering, then the impacts of these can be as great a loss as outright forfeiture, or worse. Such conditions, if significant, may warrant a detailed risk assessment of your operations, similar to an analysis of one's operational liabilities for insurance purposes. Such an assessment is a helpful tool in minimizing risk from the ESA or other potential liability.

Water Planning

Walla Walla Experience

Resolve Uncertainties

Douglas W. MacDougal is an attorney with Schwabe Williamson & Wyatt in Portland, Oregon. He represents clients in Oregon, Washington and Hawaii in water rights, permitting, regulatory matters and natural resource policy issues. He and his firm have been regularly engaged in Endangered Species, Clean Water Act and regulatory issues in basins throughout Oregon. He holds a B.S. degree in mathematics from the University of Vermont and a J.D. degree with honors from Washington & Lee University School of Law, where he was an editor of the law review. He is a member of the Oregon, Washington and Hawaii Bars, and is admitted to the Federal Courts in Oregon and Hawaii.

The potential to lose the ability to use water through ESA violation is not often recognized. Assessing this risk is not as straightforward as evaluating whether one has potentially lost water rights through use or misuse. It can nevertheless have the same effect. The risk is higher when the water use is dewatering a stream where a listed fish species is present. One recent case started as an enforcement letter from US Fish & Wildlife Service against the Walla Walla Irrigation District under Section 9 of the ESA, alleging "take" of bull trout. It evolved into a settlement agreement in which the District's right to use surface water from the Walla Walla River was voluntarily curtailed. That District is now, with others, involved in an ESA Section 10 Habitat Conservation Plan affecting the entire watershed.

It is critical to view water rights holistically to assure their preservation. It is not enough simply to look at one's water use or non-use, but also the effects of one's diversion on streams because the consequences of use may, if serious enough, ultimately result in curtailment of that use.

Control

ENHANCE CONTROL OVER RIGHTS OF TENANTS, PATRONS, OR OTHER WATER USERS

Sometimes, it is discovered that water rights are not held the way you think they should be held. A permit may be jointly held by several owners, or perhaps a lessee has applied for the permit to use water and the lessee's rights to that water are intermingled with the lessee's rights under the lease. Control issues may arise in the context of an irrigation district. For example, there may be issues regarding a patron's claim to take unilateral actions with respect to water rights being managed by the district. There may be questions of easements not obtained (or not in writing), well agreements that have been lost or never executed, or informal arrangements for the use of water not documented. The purpose of this goal is to iron out all of these problems — getting them documented, squared away and resolved. This effort may involve disentangling leasehold rights from water rights, granting or obtaining easements, entering into written well agreements, documenting water uses, and so forth. Where water uses are entangled with others, it also may include monitoring of such use to avoid forfeiture through non-use by others.

Coordination

LONG-TERM POLITICAL/LEGISLATIVE STRATEGY AND PROACTIVE ADMINISTRATIVE RULEMAKING

Too often, a water user's actions are completely uncoordinated with the larger political context and agency rulemaking that can dramatically affect water use. Since water issues are always tied in one way or another to ongoing policy debates, rulemaking, and legislation, this goal is directed at integrating water planning with the larger political involvement at the county, state and administrative levels. The federal level also cannot be ignored these days. This goal also seeks to get water users more actively (pro-actively) involved in anticipating and participating in administrative rulemaking, especially with the state water agency, and preparing for legislative moves that could effect one's water rights and plans.

Acquisition/Transfer

IDENTIFY AND ACQUIRE/TRANSFER NEW OR EXISTING WATER RIGHTS

It is possible that as a result of systematic planning efforts (the first goal) it is ascertained that your water supplies will not be sufficient to meet projected future needs. Even though raw amounts of water on the supply side may match those of the demand side of the ledger, the actual amount of water transferable and usable by you at a given location in the future may be somewhat less.

Moreover, some water that may become tied up in instream leasing or other programs may not be available when needed. If such events occur, this goal directs identification of other water rights that might be available for use, and to create a strategy for obtaining those rights.

Finally, to the extent necessary to transfer existing water rights to places of use identified under the planning goal, such transfers should be implemented according to the goal's developed phasing plan.

Conclusion

It is imperative to follow through after developing goals. Objectives should be laid out for each goal in the form of more specific actions. Then, strategies for obtaining those objectives need to be formulated and the result will be specific tasks to accomplish. As noted, it is possible that planning efforts outlined here may work hand-in-hand with water management and conservation planning processes.

Once a plan is in place, with objectives, strategies and timelines for the accomplishment of various tasks, you or any other entity in this position will be able to capitalize upon opportunities and be in a much better position to meet future needs and crises that inevitably arise.

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Dams & Salmon

Dam's Existence

Cumulative Effects

Rejection Reasoning

NOAA's Re-Approach Rejected

Discretion

Entirety of Actions

Aggregation of Impacts

DAMS AND SALMON

JUDGE REJECTS BIOP

by David Moon, Editor

On May 26, US District Court Judge James A. Redden ruled in favor of a coalition of environmental groups and the State of Oregon, invalidating NOAA Fisheries' 2004 Biological Opinion (2004BiOp) that governs the operation of the Federal Columbia River Power System for salmon and steelhead. NOAA had issued the 2004BiOp on November 30, 2004 in response to an earlier ruling by Judge Redden rejecting NOAA Fisheries' (NOAA) previous plan.

The primary issue in the case involved NOAA's assertion in the 2004BiOp that the 14 existing dams on the Columbia River already exist "and their existence is beyond the scope of the present discretion of the Corps and [Bureau of Reclamation] to reverse." 2004BiOp at 5-5. NOAA also asserted that the "Action Agencies [Corps and BOR] were not required to consult" on any elements of the pre-existing project that are beyond their current discretion or control. Fed. Def. Memo., p. 18. NOAA categorized the existing dams and nondiscretionary dam operations as part of the "environmental baseline," together with all past and present impacts from discretionary operations. 2004BiOp at 5-5, 5-6.

A crucial fact pointed out by Judge Redden was that the "2004BiOp failed to follow the approach NOAA had used in prior biological opinions of adding the effects of the proposed action to the environmental baseline and any cumulative effects to determine whether, in light of the status of the species, the proposed action would cause jeopardy." (Opinion and Order, CV 05-23-RE, page 7). "When an agency's interpretation of a regulation conflicts with its earlier interpretation, the new is 'entitled to considerably less deference' than a consistently-held agency view. *Immigration and Naturalization Service v. Cardoza-Fonseca*, 480 U.S. 421, 446 n.30 (1987), citing *Watt v. Alaska*, 451 U.S. 259, 273 (1981). In such a case, '[t]he agency will be required to show not only that its new policy is reasonable, but also to provide a reasonable rationale supporting its departure from prior practice.' *Seldovia Native Ass'n, Inc. v. Lujan*, 904 F.2d 1335, 1345 (9th Cir. 1990)." Opinion, supra at 10-11.

Judge Redden laid out four reasons for rejecting the 2004BiOp: "I find that the 2004BiOp is **legally flawed in four respects**: (1) the improper segregation of the elements of the proposed action NOAA deems to be nondiscretionary; (2) the comparison, rather than the aggregation, of the effects of the proposed action; (3) the flawed critical habitat determinations; and (4) the failure to consult adequately on both recovery and survival in the jeopardy determination." Opinion, supra at 15 (court emphasis).

The court soundly rejected NOAA's "new approach" that distinguished between "discretionary and non-discretionary elements" and stated that "case law does not support NOAA's new approach." Opinion, supra at 17. "I hold that NOAA must consult on the entire proposed action if the action agencies have meaningful discretion to operate the DAMS in a manner that complies with the ESA. Congress has provided the agencies with statutory authority and discretion to act for the benefit of listed species in operating the DAMS." Opinion, supra at 18. Judge Redden's analysis noted that district courts have considered statutorily-mandated operations of the Missouri River dams by the Corps and its obligations under the ESA, citing *American Rivers v. Corps of Engineers*, 271 F.Supp.2d 230, 251 (D. D.C. 2003), where the court applied the rule that "if an agency has **any** statutory discretion over the action in question, that agency has the authority, and thus the responsibility, to comply with the ESA." Opinion, supra at 20 (court emphasis).

Among several cases cited, the court referred back to two earlier 9th Circuit holdings to support its opinion. "'[T]he scope of the agency action is crucial because the ESA requires the biological opinion to analyze the effect of the entire agency action.' *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988) (emphasis in original). See also *Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1056 n.12 (9th Cir. 1994) ('[C]onsultation on the entirety of [Land Resource Management Plans] is required, not just an amendment to the LRMPs.') NOAA's approach would almost always limit the consultation to only a part of the action." Opinion, supra at 23.

Judge Redden strongly rejected NOAA's approach regarding the dams: "In this case, the operation of the DAMS includes both nondiscretionary and discretionary elements. The applicable statutes and case law do not support NOAA's new theory that § 402.03 insulates an action agency from accountability because of the nondiscretionary aspects of its proposed action. The segregation of discretionary and nondiscretionary elements in the 2004BiOp is a violation of law and is also arbitrary and capricious." Opinion, supra at 24.

The court also dealt with the plaintiffs' challenge to NOAA's failure to use an aggregation of the impacts from the proposed action, the environmental baseline, and cumulative impacts as the basis for the jeopardy analysis. "NOAA is **not permitted** to restrict the basis of its jeopardy analysis by segregating

Dams & Salmon

from the proposed action all elements it deems nondiscretionary, thereby consigning the effects of these elements to the environmental baseline." Opinion, supra at 26 (court emphasis). Judge Redden rejected what he called "NOAA's comparative approach in jeopardy analysis" because it "improperly circumscribes the effects of the action by basing the jeopardy decision on NOAA's estimate of the impacts attributable only to 'discretionary' elements of the proposed action. This has the effect of substantially lowering the threshold required for the mitigation elements of the proposed action." Opinion, supra at 28. The court found that NOAA's approach was arbitrary and capricious, and contrary to law: "Only a comprehensive approach to jeopardy analyses will meet the statutory mandate. 16 U.S.C. § 1536(a)(2); 50 CFR § 402.14(g)." Opinion, supra at 28-29.

Critical Habitat Failures

Turning to the issue of critical habitat determinations, the court again soundly rejected the agency's approach. "NOAA was arbitrary and capricious in arriving at its critical habitat determination as to the three affected species. NOAA (1) did not analyze the short-term negative effects of the proposed action in the context of the species' life cycles and migration patterns, (2) relied on uncertain long-term improvements to critical habitat to offset the short-term degradation of critical habitat that will occur as a result of the proposed action, and (3) determined that the species' critical habitat was sufficient for purposes of recovery even though NOAA did not have the information on in-river survival rates to make that determination." Opinion, supra at 33-34.

Recovery Prospects

The opinion also addressed the omission of "recovery" from the jeopardy determination. A key fact noted by Redden was that the 2004BiOp excluded from its jeopardy analysis consideration of whether the proposed action appreciably reduces the likelihood of species' recovery (unlike the 1995 and 2000BiOps). "Prior biological opinions attained the implicit requirement of 50 CFR § 402.02 of analyzing whether an action may jeopardize a species by appreciably reducing the species' prospects of recovery as well as survival. The regulation defines 'jeopardize the continued existence of' to include 'engag[ing] in an action that reasonably would be expected, directly or indirectly, **to reduce appreciably the likelihood of both the survival and recovery** of a listed species…' (emphasis added)." Opinion, supra at 34.

Gifford Pinchot

The court also cited NOAA's "Endangered Species Consultation Handbook" (March 1998) regarding both "survival" and "recovery" before setting forth its rationale. "Both regulation § 402.02 and NOAA's own Consultation Handbook require that listed species be protected from any appreciable reduction in their likelihood of recovery. The reasoning in *Gifford Pinchot* applies to the jeopardy analysis in a biological opinion, as well as to critical habitat determinations. Recovery must be considered separately." Opinion, supra at 35. Earlier in the opinion, Judge Redden explained his interpretation of *Gifford Pinchot*: "Accordingly, *Gifford Pinchot* requires NOAA to determine separately whether the proposed action would destroy or adversely modify critical habitat necessary for the recovery, as well as the survival, of listed species." Opinion, supra at 31. See *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Service*, 378 F.3d 1059, 1069-1070 (9th Cir. 2004).

Agency Defernce Limited

The court then ruled on the issues of NOAA's jeopardy determination and deference to an agency's decision. "NOAA's jeopardy analysis is contrary to law, because it does not address the prospects for recovery of the listed species. It is also arbitrary and capricious, because NOAA fails to provide a reasonable rationale for its significant departure from inclusion of recovery in the 2004BiOp, as it had in the 1995 and 2000BiOps. I give only limited deference to NOAA's interpretation." Opinion, supra at 35. At this point in the opinion, Redden re-cited the *Cardoza-Fonseca* quote regarding deference (see above).

Judge Redden's opinion did not spell out precisely what comes next for the federal system. Many of the same parties will be appearing before the Judge on June 10th regarding a preliminary injunction requested by fishing and conservation groups to compel the dams' operators to increase flow over the dams' spillways to help salmon survival (as opposed to flow through the power turbines). The decision has, however, led to renewed calls from Tribal representatives and environmental groups to remove the four Lower Snake River dams.

For Additional Information: David Moon, Moon Firm, 541/ 485-5350 or email: thewaterreport@hotmail.com.
NOAA website: The above referenced decision can be viewed in its entirety via a link on NOAA's website: www.salmonrecovery.gov/. The Opinion includes two attachments that provide excellent background materials on the case and the fisheries involved.

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WATER BRIEFS

GROUNDWATER RULES INVALID OR DESCHUTES MITIGATION

Idaho, Montana and Oregon are currently wrestling with the issue of groundwater/surface water conflicts and how to deal with conjunctive regulation (see Moon, TWR #15). The Oregon Court of Appeals on May 18 invalidated a set of administrative rules that were designed to manage groundwater withdrawals in the Deschutes Basin (see OAR 690-505-0400 to 690-505-0630; OAR 690-521-0100 to 690-521-0600). One set of the rules had been adopted by Oregon's Water Resources Commission to allow for new appropriations of groundwater in the basin and to establish mitigation requirements. The other set provides for the establishment of mitigation banks and mitigation credits. See Griffiths, TWR #7.

The Court of Appeals only addressed one of the three issues raised in the case, ruling that its decision was dispositive based on that issue and therefore, the other issues would not be addressed. The court framed the issue as follows: Do the rules governing groundwater appropriations and the mitigation process depart from the legal standard expressed in the pertinent statute? Petitioner contended that the rules governing mitigation for new and existing groundwater uses do not maintain the free-flowing character of the waters in the designated scenic waterways in quantities necessary for recreation, fish, and wildlife as ORS 390.835 requires. ORS 390.835(1) provides, in part: "It is declared that the highest and best uses of the waters within scenic waterways are recreation, fish and wildlife uses. The free-flowing character of these waters shall be maintained in quantities necessary for recreation, fish and wildlife uses."

The court stated that the "petitioner argued that the rules are invalid because ORS 390.835 requires that stream flows be maintained and that, under the statute, any mitigation must '*ensure the maintenance* of the free-flowing character of the scenic waterway in quantities necessary for recreation, fish and wildlife.' ORS 390.835(10) (emphasis added). In petitioner's view, the statutory language requires that 'mitigation' eliminate or fully offset the impacts of a groundwater use on scenic flows. Because the rules 'only require that mitigation "moderate" the effect of ground water use on [those] flows,' petitioner contends that the rules depart from the legal standard expressed in ORS 390.835 and, accordingly, are invalid. We agree with petitioner." Order in Case #A119779; 199 Or App (May 18, 2005).

The court went on to elaborate on the basis for its holding: "Based on the text of ORS 390.835, however, we conclude that mitigation, as the term is used in that statute, must be designed to offset the impacts to surface flows fully rather than merely to moderate those impacts. We reach that conclusion because, consistently with ORS 390.835(1), the 1995 amendments require that mitigation measures 'ensure the maintenance' of the necessary flows. The legislature delegated to the agency the authority to determine the *level* of stream flow necessary to support recreation, fish, and wildlife uses. However, the text of the statutes unambiguously indicates that, once that level is determined, it is to be *maintained*." (court emphasis).

The court also addressed the complex nature of groundwater and the fact that impacts might not be felt for several years. "The fact that there is a complex relationship between groundwater appropriations and surface flows that is difficult to measure does not excuse compliance with the statutory requirement that flows be maintained."

Statutory construction as opposed to public policy decisions was the determining factor in the court's decision. "We recognize that the question of the appropriate balance between the protection and use of the resources at issue here is a policy decision that is appropriately made by the legislature. However, on judicial review, we must rely on the text and context of the statutes that the legislature has adopted to determine its policy choice and are limited to carrying out the policy decision that it has made…If the legislature should choose to alter the policy presently embodied in the statutes, it is free to do so."

The appeals court concluded its order with the following summary: "In sum, ORS 390.835 requires the maintenance of stream flows in quantities that the commission has established as necessary for fish, wildlife, and recreation. The rules at issue in this case require only the moderation of impacts on those flows as a result of groundwater appropriations. 'Moderation' of impacts does not satisfy the statutory requirement that stream flows be 'maintained.' Additionally, because the agency does not know how and when a groundwater appropriation will impact stream flows, the rules do not provide a mechanism to sufficiently ensure the statutory objective is met. Thus, the rules depart from the statutory standard in ORS 390.835."

For info: Karen Russell (lead attorney for petitioners), WaterWatch of Oregon, 503/ 295-4039 x24 or website: www.waterwatch.org

SEWAGE SETTLEMENT CA

The US Environmental Protection Agency (EPA) on May 2 announced a $187 million consent decree with the city of San Diego, Surfrider Foundation and San Diego Baykeeper that requires improvements in the city's sewage collection system. The consent decree specifies measures that San Diego will undertake during the next year, while the parties continue to work on a long-term agreement to prevent future spills of raw sewage from their system.

San Diego's Municipal Wastewater Collection System collects wastewater from approximately 1.2 million residents over 330 square miles. The system has an estimated 2,800 miles of sewer lines and 84 pumping stations. According to the terms of the consent decree, San Diego will continue their enhanced inspection and maintenance programs in the city's wastewater collection system; system-wide cleaning, root control, sewer pipe inspection, repair or replacement; and, grease control blockage programs.

For info: Francisco Arcaute, EPA, 213/ 244-1815

WATER BRIEFS

DROUGHT RELIEF NM

RESERVOIR STORAGE

Bill Hume, Water Policy Advisor for Governor Bill Richardson, recently told The Water Report that although New Mexico was dealing with some flooding situations, the high river flows have provided welcome relief from the drought of the last six years. Hume informed TWR that since inflows to Elephant Butte and Caballo Reservoirs have resulted in their combined useable storage exceeding 400,000 acre-feet, the storage prohibitions contained in Article VII of the Rio Grande Compact were no longer in effect. Article VII of the Compact prohibits storage of water in upstream New Mexico and Colorado reservoirs constructed after 1929 when the usable water volume in Elephant Butte and Caballo Reservoirs falls below 400,000 acre-feet. The prohibitions, which have limited storage operations since July 2002, were lifted as of May 21st.

Hume noted that the lifting of storage restrictions have already resulted in dramatic improvements that will help irrigators in New Mexico. El Vado Reservoir, which stores water from the Rio Chama (tributary of the Rio Grande), now has 83,797 acre-feet in storage, most of which has been stored since the prohibition ended. This water will be available for use by the Middle Rio Grande Conservancy District and they now expect to receive a full allocation of water from the reservoir, according to Hume.

Along with the good news, however, Hume provided a caveat. "The pattern in previous long droughts in New Mexico has been to experience a high water year in the midst of the drought. So we don't know for sure if the trend has turned."

Interstate Stream Commission Director Estevan López explained how one project has helped alleviate storage problems in New Mexico. "The Interstate Stream Commission and U.S. Bureau of Reclamation have collaborated over the past three years to construct and maintain a 22-mile channel through the Elephant Butte Reservoir delta that has significantly aided in delivering water to Elephant Butte Reservoir and hastened the date in which the Article VII storage prohibition goes out of effect."

For info: Karin Stangl, NM State Engineer's Office, 505/ 699-4923 or website: http://www.ose.state.nm.us/hot-topics/press/pr-2005-05-20-UpstreamReseervoirs.pdf

KLAMATH WATER BANK CA/OR

USGS REPORT

USGS released its "*Assessment of the Klamath Project Pilot Water Bank*" on May 3. The 98-page study was undertaken to review the water bank concept within the framework of the overall basin hydrology, and assess its ability to simultaneously meet the NOAA Klamath River streamflow (in California) and USFWS lake-level requirements for Upper Klamath Lake with the current government agency strategies or potential strategies. The review was limited to technical aspects related to hydrology. Water banking was one of the "reasonable and prudent alternatives" in the 2002 Biological Opinion (BiOP) by NOAA Fisheries.

A primary purpose of the water bank was to provide enhanced spring-time flows for migration of the threatened coho salmon. The BiOp specified that 30,000 acre-feet (AF) would be available from the water bank in 2002, 50,000 AF in 2003, 75,000 AF in 2004, and 100,000 AF in 2005-2011.

Among other conclusions, the study noted that water bank activities have resulted in an approximate eight-fold increase in ground-water pumping in the vicinity of the Klamath Valley and Tule Lake subbasins. This increased pumping has resulted in acute well interference at some locations, with seasonal declines of 10 to 20 feet near pumping centers, and year-to-year declines of 2 to 8 feet over broad areas surrounding large pumping centers. The study also noted that climate variability imposes the greatest influence on the hydrologic system in the Klamath Basin above Iron Gate Dam and this variability masks possible changes caused by water bank activities.

For info: USGS' study can be viewed at www.usbr.gov/mp/kbao/docs/Final_USGS_Assessment_of_Water_Bank.pdf

EPA & MTBE US

PETITIONS REJECTED

EPA will reject petitions by California, New York and Connecticut to waive oxygen content requirements for **ref**ormulated **g**asoline (RFG).

RFG is a cleaner-burning gasoline required by the Clean Air Act (CAA) to be used in certain US metropolitan areas. The law does not specify which oxygenate must be used. Most refiners use either MTBE (**m**ethyl **t**ertiary **b**utyl **e**ther) or ethanol. RFG sold in California, New York and Connecticut, however, contains only ethanol, since each state has banned the use of MTBE due to water contamination.

EPA's Jeff Holmstead explained: "Congress has required the use of oxygenates as part of the clean fuels program and has made it clear that this requirement can only be waived if a state demonstrates that it prevents or interferes with the state's ability to meet national air quality standards. California, New York and Connecticut did not make this demonstration."

This is EPA's second response to California, which sued EPA after EPA denied the state's original petition in 2001. EPA reviewed new information submitted by California and conducted additional analysis to address the 9th Circuit Court's decision to vacate the EPA's original denial. EPA agrees with California that an oxygen content waiver would lead to a decrease in emissions that contribute to the formation of smog and particulate matter, but concludes that the overall impact is slight. EPA found that total **v**olatile **o**rganic **c**ompound and nitrogen oxide emissions would likely decrease while carbon monoxide emissions would likely increase.

EPA's denial of California's petition is based on the lack of evidence that emission impacts of a waiver would lead to earlier attainment of the air quality standards for smog or particulate matter. EPA found that neither New York nor Connecticut submitted the technical data necessary to determine what impact the waiver would have on emissions.

For info: EPA WEBSITE: www.epa.gov/otaq/rfg_regs.htm#waiver

CALENDAR

Please Note: An extended Calendar containing ongoing updates now appears on The Water Report's website: www.thewaterreport.com. Subscribers are encouraged to submit calendar entries, email: thewaterreport@hotmail.com

June 12-16 CA
AWWA Annual Conference & Exposition: "The World's Water Event," San Francisco, Moscone Center. For info: American Water Works Association, 303/ 347-0804, website: www.awwa.org/ace2005

June 12-17 CA
Pacific Fishery Management Council Meeting, Foster City, Crowne Plaza, 1221 Chess Drive. For info: PFMC, 866/ 806-7204, website: www.pccouncil.org

June 14-15 UT
NPDES Permits Program Overview, Salt Lake City. RE: Emerging Issues, NPDES Developing, Issuing & Implementing. Co-Sponsors: EPA, Water Environment Federation & Water Environment Association of Utah. For info: EPA website: http://cfpub.epa.gov/npdes/courses.cfm?program_id=0&outreach_id=197&o_type=1

June 14-16 OR
Northwest Power & Conservation Council Meeting, Portland. For info: NWPCC, 503/ 222-5161 or website: info@nwcouncil.org.

June 14-17 Canada
New Century of Water Stewardship, Banff. RE: Water Management, Development & Adaptation in Canada, Current Challenges & Future Direction. Sponsor: Canadian Water Resources Association. For info: www.reflectionsonourfuture.ca/

June 15 WA
4th Annual "State of the Hanford Site" Public Meeting, Richland, WA, Red Lion Hanford House, 802 George Washington Way,7pm. Two Additional Meetings: September 7 (Portland) & Early November (Seattle). RE: Budget Priorities, Cleanup Goals. Discuss Hanford Cleanup Decisions With Hanford's Top Management. For info: Hanford Hotline, 800-321-2008.

June 15 OK
EPA Stormwater Training, Oklahoma City. RE: Workshop for Stormwater Program Managers (Phase II). For info: EPA website: www.epa.gov/npdes/stormwater, click on "Training"

June 16-17 WA
"Tribal Energy in the Northwest" Third Annual Conference, Seattle, Renaissance Seattle Hotel. RE: Developing Energy Projects on Tribal Lands, Easements, Transmission, Business Structures, Renewables, Environmental Regulation, BPA's Role & Financing. For info: Law Seminars International, 800/ 854-8009 or website: www.lawseminars.com

June 17 UT
Utah Water Quality Board Meeting, Salt Lake City, Cannon Health Bldg., Rm125, 9:30am. For info: Utah DEQ, 801/ 538-6146, website: http://waterquality.utah.gov/wq_board/wq_board.htm

June 17 CA
California EPA – State Water Resources Control Board Meeting, Sacramento, Cal/EPA Building, 1001 I Street, 10am. For info: Debbie Irvin, Clerk to the Board, 916/ 341-5600; email: dirvin@waterboards.ca.gov; website: www.swrcb.ca.gov/wksmtgs/schedule.html

June 20-21 ID
Summer Water Law Seminar & Workshop, Sun Valley. Sponsored by Idaho Water Users Association. For info: IWUA, 208/ 344-6690, website: www.iwua.org

June 21 OR
ODEQ Walla Walla River Temperature Assessment and Water Quality Plan Public Hearing, Milton-Freewater Community Building Rotary Room, 505 Ward Street, 6-8pm. RE: TMDL Development. (see Brief, ***Insider*** #368) For info: Don Butcher, DEQ TMDL Program, 541/ 278-4603

June 22 OR
Taking Action: Oregon's Strategy for Addressing Global Warming, Portland, Multnomah Athletic Club, 1849 SW Salmon St., 7am-9am. Presenter: Gail Achterman, Member, Governor's Advisory Group on Global Warming. For info: Oregon Natural Step Network, 503/ 241-1140 or email: events@ortns.org or website: www.ortns.org

June 23-24 OR
Oregon Environmental Quality Commission Meeting, Portland, DEQ Rm 3A, 811 SW 6th Ave. For info: Day Marshall, Office of DEQ Director, 503/ 229-5990, website: www.deq.state.or.us/news/events/asp

June 24 CA
Water Supply and Reliability, San Francisco, Crowne Plaza Union Square. RE: Interstate and Intrastate Water Marketing, Desalinization, Environmental Considerations, Urban Water Management Plans, Integrity & Operation of Dams, Changes in California Water Law, Groundwater Recharge. For info: The Seminar Group, 800/ 574-4852, website: www.theseminargroup.net

June 24-25 UT
Utah Board of Water Resources Meeting, Price, Location TBA. RE: Tour Carbon and Emery Counties. For info: Molly Waters, 801/ 538-7230, email: mollywaters@utah.gov, website: www.water.utah.gov/board/2004SCHED.asp

June 27-28 CA
Indicators of Hydrologic Alteration (IHA): Software for Understanding the Ecological Consequences of Hydrologic Change, Petaluma, Walker Creek Ranch Conference Center. Sponsored by: The Nature Conservancy, RE: IHA Software Program For Ecological Implications of Flow Patterns & Water Management (Two-Day Training). For info: TNC website: www.freshwaters.org

June 27-29 HI
American Water Resources Association (AWRA) 2005 Summer Specialty Conference, Honolulu, Hyatt Regency Waikiki. RE: Traditional Asia-Pacific Practices & Sustainable Use of Watersheds. For info: www.awra.org/meetings/Hawaii2005/index.html

June 28 WY
Water and Waste Advisory Board Meeting, Lander. RE: Design and Construction Standards for Public Water Supplies, Voluntary Remediation Program, For info: Wyoming DEQ, Water Quality Division, 307/ 473-3465 or website: http://deq.state.wy.us/wqd/events.asp

June 28-29 CA
West Coast Energy Management Congress, San Diego CA, San Diego Convention Center. Largest Energy Conference and Technology Expo in California. For info: Ruth Marie, 770/ 447-5083 Fax: 770/446-3969 or email: info@aeecenter.org or website: www.aeecenter.org

June 28-29 CO
Assessing Riparian Condition Workshop, Woodland Park. RE: Values of Riparian/Wetland Areas, Methods to Assess Conditions, Assistance Options. Sponsored by the Colorado Riparian Training Cadre (interagency, interdisciplinary team). For info: Jay Thompson, Colorado Riparian Cadre Coordinator, 303/ 239-3724 or email: jay_thompson@co.blm.gov

June 29 WA
Regional Hydropower Relicensing, Seattle, Washington State Conv. & Trade Center. RE: Federal Power Act Overview: FERC's Perspective, National Legislation & Litigation Update, 401 Certifications: Updates & New Developments, Tribal Role in Relicensing, Settlement Agreements/Implementation. For info: The Seminar Group, 800/ 574-4852, website: www.theseminargroup.net

July 8 OR
Oregon Fish & Wildlife Commission, Salem, 8 am. For info: Cristy Mosset, ODFW, 503/ 947-6044, www.dfw.state.or.us/Comm/schedule.htm

July 12 OK
Oklahoma Water Resources Board Meeting, Oklahoma City, 3800 N. Classen Blvd., 9:30 am. For info: OWRB, 405/ 530-8800, website: www.owrb.state.ok.us/news/meetings/board/board-mtgs.php

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July 12-14 ME

River and Lake Restoration: Changing Landscapes, Portland, 2005 Annual Conference: Universities Council on Water Resources, Holiday Inn by the Bay. For info: Rosie Gard, UCOWR, gardr@siu.edu or website: www.ucowr.siu.edu

July 13-15 WA

Western States Water Council Meeting (WSWC 40th Anniversary), Seattle, Red Lion Hotel on Fifth Avenue, 1415 Fifth Avenue. For info: WSWC, 801/ 561.5300, website www.westgov.org/wswc/meetings.html

July 14-15 NM

Energy in the Southwest Conference, Santa Fe, Eldorado Hotel. Leading Energy Professionals Discuss Rnewables, Nuclear Power; Gas Supplies and Coal; Reliability Requirements, Cyber Security Standard 1300; New Transmission Connections; Resource Adequacy, Tribal Interests, Recent Litigation & More. For info: Law Seminars International, 800-854-8009 or website: www.clenews.com/LSI/05/05bsenm.htm

July 14-16 WA

North American Rainwater Harvesting Conference, Seattle. RE: Latest Techniques in Rainwater Management. For info: Website: www.arcsa-usa.org

July 15 UT

Utah Water Quality Board Meeting, Salt Lake City, Cannon Health Bldg., Rm125, 9:30am. For info: Utah DEQ, 801/ 538-6146, website: http://waterquality.utah.gov/wq_board/wq_board.htm

July 17-20 FL

American Society of Agricultural Engineers Annual Meeting, Tampa. RE: Environmental Engineering. For info: ASAE, 269/ 429-3852, or website: www.asae.org/meetings/index.html

July 18-22 TX

Waterpower XIV, Austin, Hilton Austin. For info: Waterpower website: www.hcipub.com/wp/index.asp

July 19 OR

Drinking Water Advisory Committee Meeting, Salem, Public Utility Commission Office, For info: Diane Weis, DHS, 503/ 731-4010 or email: diane.weis@state.or.us

July 19-22 VA

2005 Watershed Management Conference, "Managing Watersheds for Human and Natural Impacts: Engineering, Ecological and Economic Challenges," Williamsburg. RE: Computer Modeling, Field Monitoring, Watershed Science, Government Policy & Regulations, Watershed Hydrology. For info: American Society of Civil Engineers, 800/ 548-2723, or website: www.asce.org/conferences/watershedmanagement2005

July 20-23 MT

Water and the West: When Water Quality, Water Quantity and the Environment Collide, Big Sky, Huntley Lodge. Sponsored by National Water Resources Association. RE: Conflicting Water, Energy & Environmental Needs. For info: NWRA, 703/ 524-1544, email: nwra@nwra.org, website: www.nwra.org/meetings.cfm

July 21-22 MD

2005 NGWA Ground Water and Environmental Law Conference, Baltimore, Wyndham Inner Harbor. RE: Ground Water Contamination Litigation, Permitting Issues, Emerging Contaminants, and Risk Assessments. For info: Bob Masters (NGWA), 800/ 551-7379, email: rmasters@ngwa.org, website: www.ngwa.org/education/

July 21-23 OR

51st Annual Rocky Mountain Mineral Law Institute, Portland, Hilton Portland. RE: Conservation Easements, Challenges of Water for the Future, Transboundary Pollution, Planning for Drought, Federal Land Exchanges, Federal Land Use Plans Challenge, Evidence in Natural Resources Lititgation & More. For info: RMMLF, 303/ 321-8100, email: info@rmmlf.org, or website: www.rmmlf.org

July 28-29 OR

Oregon Water Resources Commission Meeting, Salem. For info: Cindy Smith (OWRD), 503/ 986-0876, website: www.wrd.state.or.us/commission/index.shtml

July 28-29 FL

Endangered Species Act, Tampa. For info: CLE Int'l, 800/ 873-7130, website: www.cle.com

August 3 OR

Oregon Water Quality, Portland, The Benson Hotel, 309 Southwest Broadway. RE: Statutory & Regulatory Authority-Clean Water Act, Water Permitting: NPDES, Ground Water Appropriation & Wetlands, Recent Developments & Decisions. For info: National Business Institute, 800/ 930-6182 or website: www.nbi-sems.com

The Water Report
Water Rights, Water Quality & Water Solutions in the West
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