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KLAMATH BASIN SCIENCE

Editors' Introduction

Throughout the West, heated debate over the science used to support water management decisions continues to engage water users, public interest groups, and the concerned government agencies. [See, Thabault, TWR #9; Luecke, TWR #3; and Spain, TWR #1] Most of this issue of *The Water Report* has been dedicated to a "point-counterpoint" discussion of the science being applied to decisions being made in the Klamath River Basin, which spans the southern Oregon / northern California border.

The Klamath Basin may be reasonably viewed as a microcosm which includes many of the contending uses currently being addressed in numerous Western river basins, including: municipal; rural; irrigation; Tribal; hydropower; fisheries; recreation; federal; and other interests.

Controversy in the Klamath River Basin is not new. Oregon's adjudication process to determine pre-1909 water rights in the Upper Basin, for instance, has been on-going for decades. However, since 2001, when the US Bureau of Reclamation — faced with a drought-limited water supply — cut off irrigation water to 90% of the Bureau's Klamath Project croplands to aid fish species listed under the federal Endangered Species Act, the ensuing public protests have been frequently featured in national news media.

The 2001 decision to shut off irrigation water in the Klamath Basin was based in part on a study by Thomas Hardy that evaluated instream flow needs for coho salmon in the Lower Klamath River — the "Hardy Phase I Report" (*Hardy Phase I*). *Hardy Phase I* was used as the interim basis for the National Marine Fisheries Service biological opinion for 2001 Klamath Project Operations. David Vogel was and is a high profile critic of both *Hardy Phase I* and the subsequent *Hardy Phase II*.

Dr. Hardy and Mr. Vogel generously agreed to have their views on the science being used to support federal water management decisions in the Klamath Basin published in *The Water Report*. After meeting the same deadline for submitting their initial articles, each author was given two weeks to respond to the other's work.

Dr. Hardy holds a PhD in Civil and Environmental Engineering, BS and MS degrees in Biology and a BS in Secondary Education. He is a member and Certified Fisheries Scientist of the American Fisheries Society, the American Society of Civil Engineers, the American Society of Photogrametry and Remote Sensing, the American Water Resources Association, the International Association for Hydraulic Research and the International Aquatic Modeling Group. He is on the Executive Committee of the International Aquatic Modeling Group, and a member of the Steering Committee of the Ecohydraulics Section of the International Association for Hydraulic Research. Dr. Hardy is Associate Director of the Utah Water Research Laboratory at Utah State University.

Mr. Vogel is a Senior Fisheries Scientist with Natural Resource Scientists, Inc. in Red Bluff, California. He has a BS in Biology and a MS in Natural Resources. Mr. Vogel has 30 years of experience which includes one year with NOAA Fisheries and 14 years with the US Fish and Wildlife Service. He is a scientific consultant on fishery research and management projects for state and federal agencies, Indian tribes, municipalities, and water districts. He has worked on west coast salmon issues for 25 years.

Your editors flipped a coin to determine the order of presentation...

Klamath Science

Controversy

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KLAMATH FISHERY SCIENCE

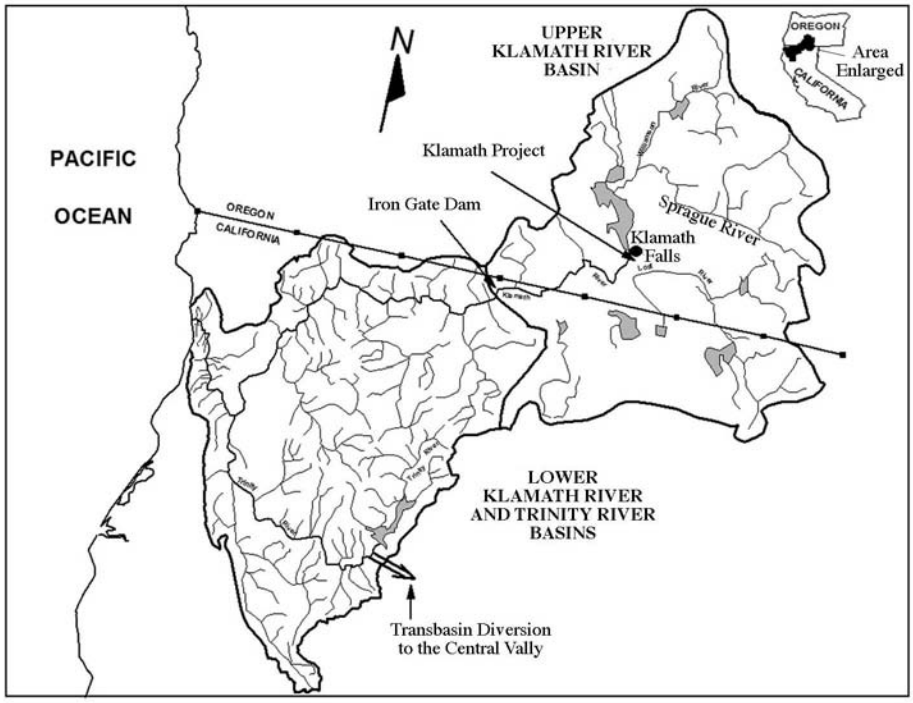
CONTROVERSY IN THE KLAMATH RIVER BASIN

by Dave Vogel, Senior Scientist, Natural Resource Scientists, Inc.

The controversy regarding Klamath Basin fishery resources is not a recent event. Controversy has existed for decades. The issues relate to many areas: economic, social, ideological, ecological, and cultural, among others. However, when all is said and done, the power to ultimately make the tough decisions lies within the complex and intertwined political, legal, regulatory, and scientific processes, the latter of which is discussed here.

My initial exposure to Klamath Basin fishery studies began more than two decades ago while serving in both temporary and permanent assignments as the US Fish and Wildlife Service (USFWS) Project Leader overseeing federal Fisheries Assistance Office operations in northern California. I got my feet wet (literally) 20 years ago when SCUBA diving and recording underwater video footage of USFWS research activities on adult salmon migration in the Klamath estuary and observing the Indian gill netting for salmon. At that time, the disputes at the forefront pertained to allocation of the salmon harvest among commercial, recreational, and Indian fishers and the transbasin water diversion from the Trinity River (a tributary to the lower Klamath River) to the Central Valley of California (see Figure 1).

Figure 1
Upper & Lower Klamath River Basins



Today, our most prominent problems focus on water allocation in the Upper and Lower Klamath River Basin. As customarily defined, the upper and lower Klamath basins are upstream and downstream of Iron Gate Dam (see Figure 1). Much of the present controversy relates to the competing beneficial uses and the science (or lack thereof) employed to justify the proposed partitioning of the Basin's water. Arguably, the recent catalyst for principal focus on Upper Basin water was the 1997 listing of the Southern Oregon - Northern California Coasts (SONCC) coho salmon as a threatened species under the federal Endangered Species Act (ESA) and the resultant ESA federal nexus provided by the US Bureau of Reclamation's Klamath Project (Klamath Project) agricultural irrigation operations in the Upper Klamath Basin. This decision by itself may not have been deemed so contentious if not for the prior listing of two fish species (Lost River sucker and shortnose sucker) as endangered in 1988 in the Upper Klamath Basin. [Note: There are other ESA-listed fish species intertwined with the Klamath Basin controversies: winter-run Chinook salmon, spring-run Chinook salmon, steelhead trout, and Delta smelt in the Central Valley. Federal biological opinions on Central Valley Project operations have incorporated the Trinity River diversions to the Central Valley. For reasons of brevity, those species will not be discussed in this article.] Although the watershed supports a wide variety of fish populations, present-day issues pertain

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Instream Flow Study

Coho Data Lacking

2001 Shut-Off Cause

Coho Rearing Habitat

mainly to ESA-listed species and Chinook salmon (the latter of which is not ESA-listed, but is highly valued among Indians and sport and commercial fishermen). [Other fish species are relevant (e.g., steelhead, green sturgeon, eulochon, lamprey, and others), but are not discussed here.] This article will emphasize coho salmon issues, although, because of ESA-caused interrelationships, the Upper Basin suckers will be included as well. I will also suggest that the science and studies needed in the Basin to improve resource management and reduce conflicts have been convoluted as a result of the ESA.

Coho Salmon in the Klamath Basin

An example (among many) of debatable Klamath Basin fishery science topics is the one pertaining to instream flows in order to maintain and enhance habitats for young coho salmon. An instream flow investigation on the main stem Klamath River has been underway for many years (dubbed "*Hardy Phase II*"). It was elevated to prominence by the National Marine Fisheries Service's (NMFS') decision to use the study's draft preliminary results to partially justify its ESA biological opinion on the Klamath Project's alleged adverse effects on coho. *Hardy Phase II* lacked sufficient data to quantify physical habitat suitability characteristics for coho fry and, alternatively, used Chinook salmon fry as a surrogate for the threatened species. Because of this scientifically weakened circumstance and incorrect assumptions on the species' life history attributes, the agency postulated that high water releases from the Iron Gate Dam were necessary to "provide necessary and adequate survival levels to avoid the likelihood of jeopardizing the continued existence of SONCC coho" (Lent 2001). Specifically, NMFS stated "Under the proposed minimum flows [from Iron Gate Dam], the amount of suitable physical habitat for these fish could be dramatically reduced" and concluded that Klamath Project operations, "would result in decreased carrying capacities for salmonid fry in the mainstem Klamath River and displacement of fry into less suitable habitat. Because of weak swimming abilities, fry are not well equipped to seek suitable habitats after displacement. As a result, the survival of salmon fry is expected to decrease under the proposed action." (NMFS 2001) The combined effect of the NMFS decision coupled with the USFWS' biological opinion on suckers resulted in the 2001 controversial shut-off of water deliveries to the Klamath Project — a first in its 95-year history.

The primary habitats for fry and juvenile coho rearing are within the Klamath River tributaries, not the main stem (Figure 2). This is attributable to the fact that most coho spawn in tributaries to the Klamath (Synder 1931, CDWR 1965, Leidy and Leidy 1984, NRC 2004). Habitats for coho are

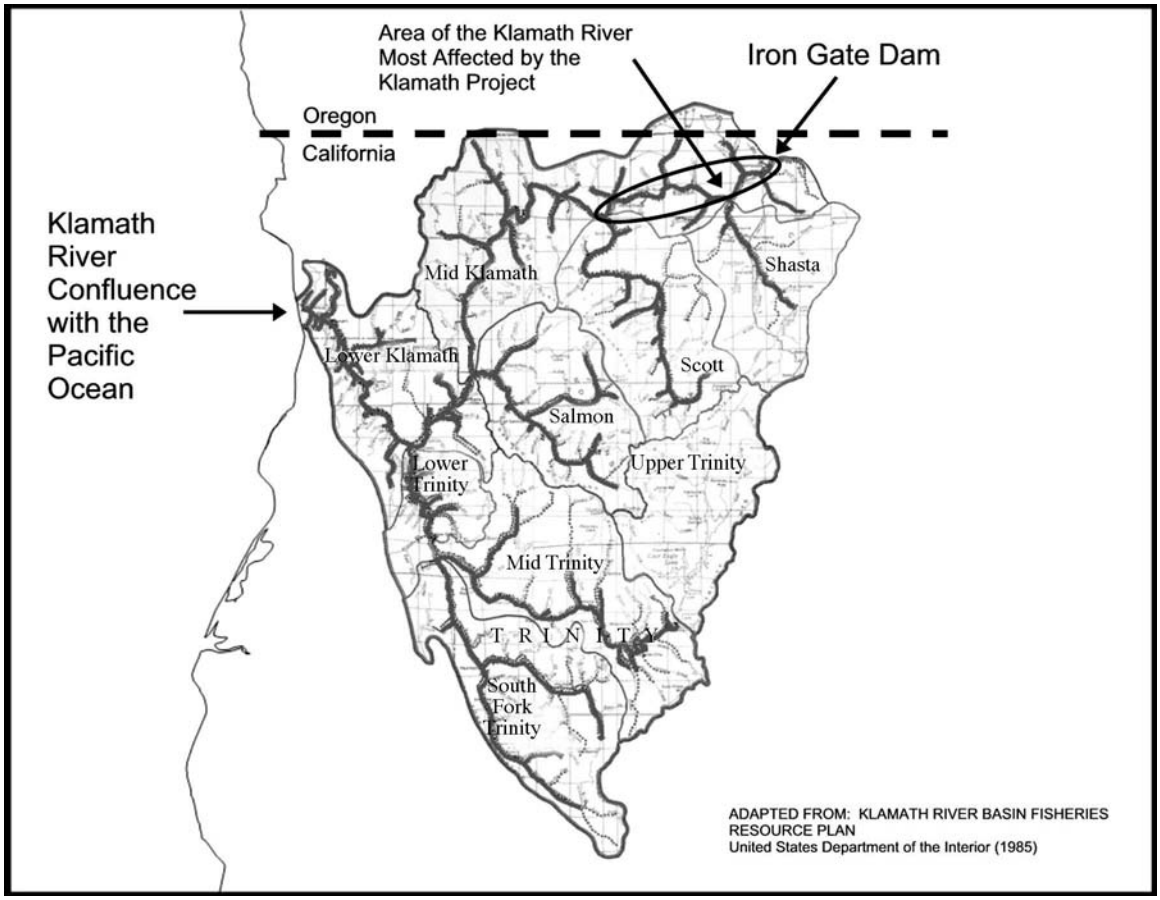

Figure 2 Coho Salmon Habitat in the Lower Klamath River Basin (Dark Lines)

Klamath Science

customarily found in smaller west coast tributaries (Scott and Crossman 1973, ODFW 1996, Flosi and Reynolds 1991, Moyle 2002) that possess characteristics not found in the main stem Klamath River. Fry and juvenile coho normally occupy small, shallow streams where there are more structurally complex habitats (e.g., woody debris) than are found in larger, mainstream river systems (Vogel and Marine 2000). NMFS identified 51 tributaries to the Klamath River as important coho habitat (NMFS 2002).

Klamath Project Effects

Klamath Project operations cannot physically influence those principal coho spawning and rearing habitats. To some degree (depending on specific timing and magnitude), the Klamath Project can change main stem flows and, therefore, may affect habitat for adult coho upstream migration and downstream migration of juvenile fish to the ocean. Contingent on many factors, the influence on the main stem is attenuated in the reach downstream of the dam. However, very few coho fry use the main stem. This should have been recognized as an irrefutable biological fact. As this did not occur, much of the rationale for implementing the ESA — which has focused on Klamath Project operation effects on coho fry rearing in the main stem — is questionable. Lacking supportive scientific data and, more importantly, ignoring scientific data developed in the Klamath Basin and other watersheds, the NMFS biological opinions presumed that specific, high instream flows for coho rearing habitat were necessary in that area to avoid adverse impacts on Klamath Basin coho populations (NMFS 2001, 2002). This is one of the primary reasons NMFS concluded that ongoing Klamath Project operations would jeopardize the continued existence of SONCC coho (Knowles 2002).

BiOp Premise

The NMFS biological opinions' premise concerning coho rearing habitat in the Klamath River was not convincing and subject to considerable scientific debate for the following reasons:

1) The potential importance of coho rearing habitat in the main stem river was not empirically established through scientific research.
2) The biological opinion was in contrast to the preponderance of scientific evidence developed in other rivers and streams and the known widespread ecological regularity of rearing habitat characteristics for coho salmon.
3) The main stem Klamath River immediately downstream of Iron Gate Dam does not contain the known habitat attributes preferred by coho based on the available data. (Vogel 2003)

Chinook v. Coho

Ironically, NMFS' own status report on the species states: "… coho typically spawn and rear in small tributaries" (Weitkamp et al. 1995). As a factual matter, the principal coho rearing habitats are within the numerous Klamath River tributaries — which is not surprising given the well-known characteristics of coho rearing habitat (e.g., as previously described and by PMFC 1999, CDFG 2002). Furthermore, researchers have established that young Chinook and coho salmon do not interact well and use significantly different habitats (Sandercock 1996; Healey 1996). The scientific evidence concerning Klamath Project effects on coho fry rearing in the main stem Klamath River should not have been debated to such a high degree, yet the practice remains. In my opinion, the ESA unnaturally elevated the scientific debate and is stifling or misdirecting the objective research needed to resolve the resource conflicts on the river.

Implementation of the ESA in the Klamath Basin and the Federal Nexus

ESA Purpose

The Endangered Species Act states: "The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved… ." Despite this so-called "ecosystem approach" to species recovery advocated by the USFWS and NMFS, their actions in the Klamath Basin over the past decade amply demonstrate that the exact opposite has taken place. Those agencies have and continue to focused on: 1) a single-species approach; and 2) Klamath Project operations (Vogel 2004). This unfortunate circumstance has occurred both in the Lower Basin with threatened coho issues and in the Upper Basin with endangered sucker issues.

Narrow Focus

The science related to ESA-listed fish species in the Klamath Basin has principally centered on federal actions (via ESA Section 7 consultations) and, therefore, is not comprehensive or objective. The federal ESA nexus has governed the focus of science in the Klamath watershed; truly objective science would not be based on federal actions. Federal bureaucrats commit their attention to those activities where they have the most control, authority, or funding opportunities, not necessarily in areas where the greatest benefits to species may be derived. It is not responsible to allocate the majority of agency resources on efforts that would result in negligible benefits to species recovery. This circumstance has often occurred and is a fundamental flaw in the ESA; it diverts valuable resources away from attention on species recovery.

Sucker Listings

Upper Basin. At the time of the two sucker listings in 1988, the Klamath Project was not identified as having known adverse affects on the sucker populations. Numerous documents prior to the listings made it evident that the USFWS would not focus on the Klamath Project and cited a myriad of other

Klamath Science Problems Ignored

factors limiting the suckers and their habitats. However, four years later, using limited or no empirical data, USFWS turned to the Klamath Project as their singular focus. This happened as a result of the federal nexus and ESA Section 7 consultations. Paradoxically, since the early 1990s, despite new beneficial, factual evidence on the improving status of the species and lack of relationship with Klamath Project operations, USFWS became even more centered on project operations and increased restrictions on irrigators instead of paying attention to more obvious, fundamental problems for the species (Vogel 2004).

Lower Basin. A similar circumstance occurred with NMFS during and after the 1997 coho salmon listing in the Lower Basin. The agency cited reasons to list coho salmon, but excluded Klamath Project operations as a significant factor affecting the species. Numerous other major factors limiting the species and its habitats were cited as problems for recovery. However, shortly following the listing, and with no supporting data, NMFS chose to center its attention on the Klamath Project as the principal factor affecting coho salmon. Here again, ESA Section 7 consultations caused the shift in emphasis. This occurred despite well-documented impacts on salmon that had been caused by other factors [e.g., over-fishing, logging, mining (W.M. Kier Assoc. 1991) and habitat degradation in the tributaries (CH2M Hill 1985, W.M. Kier Assoc. 1991)].

Both agencies adopted a single-minded approach of focusing on Klamath Project operations to artificially create high reservoir levels and high reservoir releases. This puzzling, similar sequence of events has yet to be explained. To date, there have been no compelling, empirical scientific data developed that would justify changing from an ESA-advocated broad-spectrum approach for species recovery in the upper and lower basins to a narrow, singular non-ecosystem-based focus on Klamath Project operations (Vogel 2004).

Upper Basin v. Lower Basin Fish Needs

Adding fuel to the fire, the two fish agencies developed biological opinions on Klamath Project operations that created conflicts between Upper and Lower Basin presumed fish needs. The USFWS mandated higher-than-historical reservoir storage in the Upper Basin for questionable benefits to endangered suckers, while NMFS mandated concurrent high releases from the same Upper Basin reservoir for debatable needs of coho salmon. In uncoordinated fashion, they further exacerbated the scientific uncertainties and difficulties in implementation of such measures by using different hydrological water year criteria. Additionally, the two biological opinions adversely impacted water supplies to the Upper Basin's National Wildlife Refuges, wetlands, and surrounding farm land that support habitat and forage for hundreds of non-listed species.

Peer Review

After external peer review of the two agencies' actions, it was ultimately determined that the scientific justifications for high reservoir levels and high reservoir releases were not supported by empirical scientific evidence. In fact, the agencies' actions were contrary to the ESA's approach for using "the best available commercial and scientific data" and the ESA's so-called "ecosystem-based" approach.

Instream Flow for Salmon in the Main Stem Klamath River

Flow Impact?

Despite all the scientific research and funds expended on the Klamath River, no entity has developed any data to support the premise that specific Iron Gate releases over the past several decades has been a significant factor limiting Klamath River salmon populations. Anglin (1994), in performing a USFWS scoping evaluation in the lower river for the Yurok Tribe, concluded that, "No specific streamflow conditions affecting anadromous fish production were identified in the lower mainstem Klamath River, with the exception of drought effects over the last several years." Another agency report concluded that, "The evidence assembled does not indicate that localized flow effects are a major limiting factor for anadromous fish in the Klamath River." (NBS 1995). Primary limiting factors for fish production were believed to be watershed condition and water quality, degraded physical habitat, and under-escapement of spawning populations (Anglin 1994). Nevertheless, the most recent attention has been oriented toward Iron Gate Dam releases; the reason for which I believe is ESA-driven, not science-driven.

Limiting Factors

In evaluating the draft *Hardy Phase II* report (Hardy and Addley 2001) concerning the recent main stem instream flow study, the National Research Council's (NRC) final Klamath report stressed the importance of coho habitats in the tributaries and the fact that Iron Gate releases would have negligible effects on coho rearing in the main stem channel:

NRC: Modeling Flaws

"The NRC committee read and discussed the draft Hardy Phase II report. The committee saw the modeling approach as flawed by heavy reliance on analogies between habitat requirements for Chinook salmon and habitat requirements for coho salmon. Habitat requirements for Chinook salmon are better known, but the behavior and environmental requirements of Chinook salmon differ substantially from those of coho salmon. To the extent that this approach is carried forward into the final report, the NRC committee's skepticism about the validity of the analogy would also be carried forward. In addition,

Klamath Science

the NRC committee, as explained elsewhere in this chapter, concludes that rearing of coho in the Klamath main stem is much less important than rearing of coho in tributaries, which are the preferred rearing habitat of coho. Thus, the importance that can be attached to regulation of flows in the main stem is probably less, in the viewpoint of the committee, for coho than it would be for Chinook, for example. Because the Hardy Phase II draft report does not deal with the tributaries, the analysis in the draft Phase II diverged from the committee's analysis of the critical requirements for coho."

(NRC 2004)

NMFS' BiOp Flaws

NMFS' 2001 biological opinion was flawed by misuse of the preliminary study results in a "forced" application to the ESA Section 7 consultation for Klamath Project operations. Additionally, the draft study report had not yet been issued for external review. If NMFS had not used the draft study results as a significant justification to argue for higher Iron Gate Dam releases for coho, the 2001 decision on the Klamath Project water curtailment likely would not have been so controversial. Nevertheless, NMFS again used the preliminary study results from a review draft report (Hardy and Addley 2001) in developing its 2002 biological opinion knowing that the report was not complete and could change in its final version. Hopefully, the NRC's peer review will assist in avoiding such problems in the future.

Iron Gate Releases

Historical Iron Gate Dam releases have not been shown, and are unlikely to be later demonstrated, to limit salmonid populations. Ample scientific research and factual evidence have proven that a more ecologically-based approach is needed for fishery restoration. This is particularly true of the Klamath River Basin where so many elements are known to be limiting anadromous salmonid production. The question is: What has been the relative effect of the main stem Klamath River flow management on fish populations among all factors affecting those populations? The best available information indicates

More Important Factors

numerous factors, other than the recent historical flow regime, are of overriding importance in influencing Klamath River fishery resources. For example, unlike other watersheds elsewhere where high flows are limited due to large upstream water storage projects, Klamath main stem channel forming and maintenance flows have not likely been a problem for the localized effects of Iron Gate Dam releases because peak flows have not appreciably changed (CDWR 1981). However, armoring of riverbed gravels below Iron Gate Dam has been identified as a potential limiting factor (CDWR 1981, NBS 1995). Retention of gravels behind the dam, not streamflow, has been among the most likely causes of this problem. Physical stream channel rehabilitation and gravel replenishment measures have been recommended (CDWR 1981).

Restoration

Given the current understanding of ecosystem-level responses and state-of-the-art restoration ecology, there is no guaranteed expectation of significant improvement in overall ecosystem function through measures implemented on the part of the Klamath Project in isolation from other actions that may occur elsewhere throughout the Basin. In fact, the National Research Council's Advisory Committee on Restoration of Aquatic Ecosystems cautioned: "Restoration is different from habitat creation, reclamation, and rehabilitation — it is a holistic process not achieved through the isolated manipulation of individual elements." (NRC 1992)

Limited Data

There is a need to shift the current focus to other scientific aspects on streamflow. For the previously described reasons, the debate over coho rearing habitats in the main stem Klamath River should subside. However, data on important factors that may affect the fish populations such as water temperatures, diseases, and outmigration flow are limited or lacking. For example, because all juvenile salmonids must migrate from the main stem channel to the ocean (in some instances over long distances) an objective

Suggestions

examination of a flow regime to accommodate that critical life stage is warranted. Carefully controlled experiments conducted by tagging and releasing juvenile fish under different water operational scenarios would be valuable to test hypotheses of potential effects of flow and resultant survival and recruitment to the adult life phase. This focus is supported by the NRC final Klamath Report:

"The committee recognizes that main-stem flow may directly affect the coho population at the time of downstream migration of smolts. While it is unclear whether additional water would favor the success of this migration, it is also clear, even in the absence of modeling, that NMFS can argue, given the absence of data to the contrary, that there is some probability of benefit for the smolts to be derived from minimum flows at the time of smolt migration, as expressed in the NMFS biological opinion of 2002. Adaptive management principles could be applied to this issue." (NRC 2004)

I am not aware of any current comprehensive scientific investigations on these topics in the Basin. Although numerous multi-disciplinary studies (which include stakeholders) are underway in California's Central Valley rivers and elsewhere, they are long overdue for the Klamath basin. Recent successful research and restoration projects by CALFED have demonstrated the value of having key stakeholder involvement [see Thabault, TWR #]). Such an effort should be integrated and placed in context with comprehensive watershed restoration programs.

Klamath Science

Principles

BiOp Problems

NAS Evaluation

NRC Conclusions

Problems Persist

Peer Review and the National Research Council's Klamath Report

Peer review has many forms and functions. It can provide balance and fair treatment of relevant scientific information. Good science and the best application of accepted scientific principles demand diversity in perspectives and opinions. Execution of peer review should not be a facade of "like-minded" individuals or agencies promoting or protecting their hypotheses, policies, or positions. Peer review can help examination of data with clear objectivity using widely accepted, fundamental scientific principles (Vogel 2004) and help to prevent highly selective use of one-sided information.

Until recently, many Klamath Basin fishery science issues, research studies, and management decisions were largely non-peer reviewed. Although the fishery agencies claimed to have conducted some form of "internal" peer review of their biological opinions related to Klamath Project operations, they were not performed in a manner conducive to allowing unbiased scientific review. In 2001, only selected individuals were included in the formulation of the two final biological opinions that cut off water to the Klamath Project. Furthermore, only certain information was used by the USFWS and NMFS, and additional relevant, science-based information was either overlooked or ignored. The agencies gave greater weight to theoretical information to support an assumption for high lake levels and high reservoir releases without acknowledging empirical data that did not support their premise (Vogel 2002).

Because of the heated controversy over the federal government's decision to eliminate water deliveries to the Klamath Project in 2001, the National Academy of Science was asked by the Department of Interior and Department of Commerce to "evaluate the strength of scientific support for the biological assessments and biological opinions on the three listed species, and to identify requirements for recovery of the species" (NRC 2004). Although the NRC Klamath committee agreed with many of the agencies' decisions, after extensive review, they ultimately concluded that there was insufficient scientific support for the argument of high lake levels for suckers (Upper Klamath Lake) and high Iron Gate Dam releases for coho. Notably, the peer review committee members were unanimous in their conclusions on both biological opinions.

Many of the most pertinent findings, conclusions, and recommendations of the NRC Klamath Committee were not new to the USFWS or NMFS at the time those agencies developed their biological opinions on Klamath Project operations. The NRC final report advocates a watershed approach, peer review, greater stakeholder involvement, oversight of agency actions, focus on factors other than the Klamath Project operations, reduction of resource conflicts, and incorporation of the principles of adaptive management toward species recovery. Over the past decade, much of the same and similar technical findings and recommendations were reported to those two agencies, but were mainly ignored (e.g., Vogel 1992, KBWUPA 1993, KBWUPA et al. 1994, KWUA et al. 2001, and comments by the KWUA on the USFWS and NMFS biological opinions) (Vogel 2004).

Summary

There are recent signs of progress associated with scientific research and ESA activities in the Basin. However, implementation of efforts toward species recovery remains uncoordinated between agency programs and lacks meaningful peer review in many important areas. Some individuals within the agencies are in a state of denial over the findings and conclusions of the NRC's final Klamath report. Additionally, there is a trend among some groups to spend time and funds unnecessarily on litigation when it comes to ESA issues; this can result in scientific experts spending more time in court instead of conducting important field research that may lead to species recovery. This practice will stifle the scientific advancement of recovery efforts and divert resources into unproductive venues. Despite the NRC's report, USFWS and NMFS still retain too much emphasis on the Klamath Project (as indicated from the most recent biological opinions) instead of moving towards a watershed-wide approach (Vogel 2004). The agencies need to begin focusing on other, more-important factors affecting the species and use more creative and inclusive methods to satisfy the ESA statute (NRC 2004). If the manner in which the ESA is administered in the Klamath Basin does not change, it is unlikely that the coho or the suckers will ever be delisted. This circumstance would not be based on biological reasons, but caused by procedural problems with the ESA that can inadvertently steer applied science away from the most important issues (Vogel 2004).

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KLAMATH BASIN WATER RESOURCE ISSUES

HARDY PHASE II

PERSPECTIVES FROM THE CENTER OF THE EVENT HORIZON

by Dr. Thomas B. Hardy, Ph.D, Associate Director, Utah Water Research Laboratory

Introduction: On Perspectives

Most individuals on the planet know that no two objects may exist at the same location at the same time. This simple fact of physics in small or great measure underlies some of the differences in perceptions surrounding the *Hardy Phase II* instream flow recommendations. For example, say we have many individuals (Klamath Basin) observing an event horizon (Hardy, Phase I/II). Every observer will, by our aforementioned physics fact, have to occupy a different location (or time). Therefore they must have a different viewpoint and hence, perceptions of the event. These differences are magnified further because they are dependent on an individual's ability to even detect an event, let alone differing capacities to understand what they are observing. Two people standing before a radio tower both see the tower (event), but the one with a working radio perceives something else entirely. Studies into the mechanisms of cognitive thought clearly show that perceptions of an event are filtered through an individual's current frame of reference (how an event is interpreted based cumulative experience) and state-of-mind. An individual's frame of reference and/or state-of-mind is influenced by such factors as native cognitive abilities, cumulative experiences, health, preconceptions, expectations, as well as a myriad of other factors that influence both at any given instant. That there are many viewpoints, leading to different perceptions, and ultimately expressions via personal opinions arising from an event like the *Hardy Phase II* report should therefore be of no surprise. The proof of these tenets is easily found by even a casual reading of the local, regional, and national paper articles, affidavits in the seemingly endless rounds of litigation, and various web pages dedicated to water and fish issues in the Klamath River Basin over the last several years.

This article addresses my perceptions of the *Hardy Phase II* event and specifically the broad array of diametrically opposing perceptions, which range from "lack of peer review" to "best available science" to "junk science." As the principal author of the report, I am sure that most will agree that I have a rather unique perspective in that I am at the center of the event horizon looking out. In essence, I have observed the observers and their interpretations of *Hardy Phase II*, expressed across a wide spectrum of opinions. When I examine press releases, web pages, and many other forms of communication highlighting these differing perceptions and opinions, I truly wonder if some are viewing the same event, confusing Phase II with an X-Files episode ('The truth is out there'), or when more pragmatically minded, attribute these differences to that famous line from the American movie classic *Cool Hand Luke,* "What we have here is a failure to communicate." In the remaining pages of this article, I will strive to rectify many apparent misperceptions using well-documented facts from my unique view at the center of the event while looking out. I fully understand that it is likely a disparate range of perceptions will exist after reading this article and that some individuals will continue to dispute the facts. After all, everyone is entitled to their opinion even if they choose to actively ignore the fact(s). I suggest we all have a good laugh and remember, "Never let the facts get in the way of a good controversy."

Hardy Phase I and Phase II Reports

First, it will be helpful to put both the *Hardy Phase I* and *Phase II* efforts into their proper perspective(s), that is, from the center of the event looking out. In the beginning (not to be confused by creation or the big bang), the federal government and others were actively engaged in the Oregon adjudication of the Upper Klamath Basin. Within that context, the federal government's water needs encompassed wildlife refuges, wild and scenic rivers, several federal land management agencies operating under numerous congressional mandates (e.g., the Endangered Species Act; the Organic Act; and the Multiple Use Sustained Yield Act), tribal water rights, and its inherent tribal trust responsibilities. It is the responsibility of the federal Department of Justice to represent the collective federal interest as the "United States" in these types of matters. It should be apparent to most that settlement of its federal and tribal water claims in Oregon would ultimately have a direct bearing on the amount and timing of water leaving Oregon and flowing into the Lower Klamath River in California.

I have heard from reliable sources that the same federal government has these same basic needs, mandates and tribal trust responsibilities downstream of Oregon in California. Knowing what would be required downstream prior to agreeing to what will be left upstream seems like a rational based fact to me, and so I agreed to be of assistance when asked by Uncle Sam to help. I am reasonably certain that the request for assistance was not predicated on my photogenic characteristics as evidenced by some of

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the more recalcitrant web sites about the Klamath. Furthermore, I am not an expert because I wear a coat and tie, carry a briefcase and come from out-of-town. To wit, I exclusively wear Hawaiian shirts and Birkenstocks (yes, even in winter in Utah) and I am never home enough not to be from out-of-town. As a factual matter, it helps that I am a recognized national and international expert within this complex multi-disciplinary area of science and engineering. I am, after all, a member of a National Academy of Science committee reviewing the instream flow program and technical approaches being proposed by Texas to guide the state in it's instream flow and water allocation strategies.

No IFIM Request

Contrary to urban legend in some parts of the Klamath Basin, I was not asked to conduct an "Instream Flow Incremental Methodology" (IFIM) type of study [see Stalnaker, C., B.L. Lamb, J. Henriksen, K. Bovee, and J. Bartholow. (1995). *The Instream Flow Incremental Methodology – A Primer for IFIM*. US Department of the Interior, National Biological Service, Washington, D.C. Biological Report 29, March 1995]. An IFIM based study by its very definition would have required a broad level of stake-holder involvement across a broad spectrum of private, city, county, state, federal, and non-governmental organizations, and to the informed reader, a protracted time frame. This lag-time in particular would not meet the government's needs in the adjudication process. Instead, I was asked to evaluate available existing information and make my best professional recommendation of the instream flow needs in the Lower Klamath River. The recommendation (*Hardy Phase I*) would provide the government with some rational basis to guide their settlement efforts in the Oregon adjudication.

The Assigned Task

My experience over the years in all matters related to instream flow issues has given me a well-developed inner sense to be prescient to the likely presence of turbulent waters ahead. A feeling rather like what one gets when standing across the room from a coffee table, having turned off the lights, then proceeding to walk boldly across the room stopping (preferably) just short of the table. Most individuals will get a very distinct "feeling" of impending contact well short of the table that increases in intensity as they perceive (in total blackness) they are near the table. This sense of impending contact (I call it a cringe) can be mitigated of course with the use of shin guards. Given an innate desire to avoid severe shin trauma, I requested and was granted "permission" to seek technical assistance and input during Phase I that ultimately carried forward into Phase II. In our metaphorical world, I sought to protect my shins by assembly of a technical review team composed of representatives of the US Fish and Wildlife Service; Bureau of Reclamation; Bureau of Indian Affairs; US Geological Survey; the National Marine Fisheries Service; the Yurok, Hoopa Valley, and Karuk Tribes (given the government's trust responsibilities) ; and the California Department of Fish and Game as the state level resource management agency. Note that this request was limited to entities with legislative or governmental requirements for management of the aquatic resources, and most importantly from a technical perspective, extensive on-the-ground experience with the fisheries resources within the Lower Klamath River. I also made it clear to the technical team from the outset that I was seeking technical input, and had a general desire for some form of concurrence within the group if possible, but at the end of the day, it was my responsibility to make the recommendations. After all, it would be my shins, not theirs, that would be vulnerable to contact with the table.

Technical Input

After initiation of Phase I, it became apparent that no site-specific data from the Lower Klamath River commonly utilized in the modeling and assessment of physical habitat based needs of the aquatic resources existed upon which to make recommendations for instream flows. That fact lead to the use of recognized hydrologic based instream flow assessment methods and the now famous (or infamous depending on your frame of reference) *Hardy Phase I* recommendations. As an important aside, again contrary to many perceptions, the Phase I work was reviewed by the various technical representatives of the resource agencies and the general public-at-large within the Klamath Basin while in draft form. Comments (where deemed technically defensible and germane to the issue at hand) were incorporated into the final document and recommendations. Having clearly recognized the limitations and biases inherent in the estimates derived from the Phase I work (I am not saying they were wrong or "junk science"), Phase II was started as a means to obtain the requisite site-specific data necessary to employ other state-of-the-art instream flow assessment methods.

Site Specific Data Lacking

The Technical Team (and others) were asked to provided input and technical peer review for each of the following steps of the Phase II process:

- Study design
- Study reach selection
- Study site selection
- Field methods
- Hydrology modeling
- Hydraulic modeling calibration and simulations

Phase II: Obtain Data

Steps

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- Water quality modeling
- Species and life stage periodicities
- Species and life stage habitat suitability criteria development and validation
- Habitat modeling development and validation
- Integration of study results
- Instream flow recommendation methodology
- Preliminary Draft Report
- Draft Report

Phase II Review

I will note at this juncture that the Draft Phase II report was sent out for general public review after receiving and incorporating (where germane) the technical team comments on the preliminary draft report. I also sent the draft report to several internationally recognized instream flow experts (all non-USA based) with no history or vested interest in the Klamath River. I undertook this independent peer review external to the formal Klamath review process on my own initiative (I added padding to my shin guards). I have (and continue) to hear some individuals claim that the *Hardy Phase II* work lacks peer review. The basis of this perception is not borne out by the facts.

Collaborative Modeling

The Phase II efforts also took on a more collaborative nature with the technical team. Collaborative modeling efforts were undertaken by US Geological Survey and the US Bureau of Reclamation for water quantity and water quality modeling for the Lower Klamath River. The US Fish and Wildlife Service, the California Department of Fish and Game, and the Yurok, Hoopa, and Karuk Tribes provided collaborative work on fish distributions, habitat mapping, habitat suitability curve data collection and analyses, and miscellaneous supporting fieldwork. As documented in the *Hardy Phase II* report, all technical study components — ranging from study design, reach delineation, study site selection, field methodology (both physical and biological), hydraulic modeling, and habitat modeling — were systematically reviewed by the technical team prior to their adoption and/or implementation within *Hardy Phase II*. This warrants some further clarification given the misperceptions of some parties.

Intensive Technical Review

The technical review process entailed much more than a simple comment matrix based on a classical review process of the draft report. Technical team meetings were typically multi-day events almost on a monthly basis during Phase II. These meetings involved extensive and detailed discussions (at time even arguments) on quality of data, methods, analytical and modeling approaches, and even just plain old differences in opinions. For example, during the evaluations of the study reaches and site selection, the team examined the whole lower river and worked through the selection of sites to the point of where the study site should start and where it should end. Remember, the team is composed of individuals who have extensive experience on the river through countless hours of sampling. During the review of the hydraulic model calibration and simulation results, the team examined the modeling results for water surfaces and velocities at measured and simulated flows cross-section - by - cross-section and at times vertical-by-vertical. This type of intensive review process of the modeling included simulating a known flow rate at the Trees of Heaven study site and then the team went into the field to compare the spatial pattern of the velocity predictions against the patterns of flow in the river at each of the cross sections. The model worked well, for those who wonder about the outcome of this particular activity. This level of technical review far exceeds any level of peer review associated with referred journal articles and is most like the technical reviews that are undertaken during a litigation process, to which I am also intimately familiar. This again makes the contentions of "lack of peer review" and "junk science" ring hollow in my ears.

Comments

My own independent peer reviews and Klamath based review process resulted in comments from 19 agencies, organizations, and individuals comprising 726 individual comments. The vast majority of comments were editorial in nature, or suggestions for improving clarity (i.e., many are redundant, having been identified by more than one reviewer). Some comments were inexplicably recycled from Phase I and had nothing to do with Phase II. Several were advocacy-based position statements (i.e., nothing to do with technical or editorial issues) and I will recommend to the submitter(s) that it might be better to direct these to someone else. The remaining technical-based comments are, in my experience as a submitter and as a reviewer for several international peer reviewed technical journals, typical of those received when submitting an article for publication and indicative of an article that would be accepted for publication after revision.

Scientific Credibility

My perception of the scientific credibility of the Phase II work is not as egocentric or self-serving as some might at first blush conclude, especially given the oft-heard mantra within the Klamath Basin of "junk science" and "lack of peer review." In my admittedly subjective attempt to clarify others' view of these perceptions from the center of the event horizon surrounding the Phase II work, I offer the following facts. The paper *Field Validation of Behavioral Based Physical Habitat Modeling of Chinook*

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Fry Habitat Modeling

Fry in the Klamath River, extracted from the draft *Hardy Phase II* report, was presented at the 5th International Symposium on Ecohydraulics held in Madrid, Spain, on the 12th-17th of September 2004. The international scientific committee for the symposium accepted the paper for presentation *after* peer review. More pointedly, based on the strength of the paper, which includes the site-characterization and hydrodynamic modeling approaches used in Phase II, the paper *Validation of Behavioral Based Escape Cover Modeling in the Lower Klamath River,* which expands on the previous paper to include all fry and juvenile life stages analyzed in the draft report, was solicited for inclusion in an upcoming special peer reviewed issue of the International Journal of River Basin Management. Some Klamath reviewers maintain that the habitat modeling for fry was not scientifically defensible in the Klamath based on their observations of fish in different rivers — but to date these reviewers have not provided Klamath specific data to support that position.

Envelope Curve Support

The paper *The Ecological Niche Basis for Envelope Habitat Suitability Curves in Instream Flow Assessments* was also accepted and presented at the same symposium. This paper, as the title suggests, lays out the ecological basis for envelope curves and relies on the results from Phase II as the case example. [Editor's note: an "envelope curve" envelops information from distinct sources into a single curve.] One might conclude that this supports the science behind the development and use of the generic envelope curves used for some life stages in the Phase II report that were nonetheless criticized in some of the technical comments as a non-valid approach. Finally, I gave one of the invited keynote lectures — *Incorporation of Fish Behavior in Physical Habitat Models* — using the Phase II technical work as the basis for the talk. These facts, as seen from the center of the event horizon, provide a very different viewpoint relative to those who continue to doubt the scientific credibility or lack of peer review in *Hardy Phase II*.

Recognized Standard

Another way of judging the scientific defensibility of the methods that were adopted and applied in Phase II is to compare them against some recognized standard, apart from the peer review elucidated above. I will direct the readers to the work of the Instream Flow Council ("IFC"— see website: www.instreamflowcouncil.org/ifchome.htm) and their publication *Instream Flows for Riverine Resource Stewardship* (IFC 2004). This book represents nearly five years of dedication from its 16 state and provincial fish and wildlife agency authors from across the US and Canada, and reflects one of the outcomes of the federally funded National Instream Flow Program Assessment (NIFPA). The project brought together the instream flow coordinators of fish and wildlife agencies from every state in the United States for the purpose of assessing the weaknesses, strengths and challenges of each state's instream flow program. The effort included a detailed assessment of each state's instream flow program that ultimately led to the formation of the IFC to implement many of the NIFPA recommendations and maintain an international network of instream flow professionals. An example from the *Hardy Phase II* work is used as an example of how to properly validate habitat modeling. Secondly, I would direct readers to the European Union's COST 626 program represented by the work of the European Aquatic Modeling Network ("EAMN"— see website: www.bygg.ntnu.no/~borsanyi/eamn-web/index.htm). Scientists and engineers from over 17 countries with the specific objective to define the state-of-the-art in methods and modeling of riverine habitats comprise the EAMN. There assessments are contained on the links within their web pages. Readers taking the time to examine the materials from these two groups will clearly see that the field collection methods, analytical methods, modeling approaches and framework for interpretation of the results that were used in *Hardy Phase II* are identified as state-of-the-art at the national and international levels. No Twinkies here.

Instream Flow Assessment

Habitat Modeling

Flow Data

A few minor facts will also help to dispel (hopefully) some additional misperceptions about *Hardy Phase II*. The primary reason the report had not been finalized after receipt of the peer review evaluations and Klamath review comments is that the flows provided to me by the federal government had been developed as part of the Oregon adjudication alternative dispute resolution process. Unfortunately, permission to use the data (as required by that process) was not obtained and the government's request to use the information after the fact was apparently blocked by one or more of the parties in the Oregon Klamath Basin Adjudication. Therefore, any of the information that relied upon these flows (read recommendations) could not be utilized in a litigative setting — not that the Klamath suffers from a lack of litigation. Importantly, it was not due to some technical flaw, nor did it represent junk science or lack of peer review.

New Flow Data

In the last few months, I have been provided alternative flows to what was used in Phase II by the Bureau of Reclamation that would permit the Phase II analyses to be re-run and the report completed. This work is currently underway. In addition, Phase II will include an additional evaluation of instream flow recommendations based on new work within the Bureau of Reclamation for estimated no-project flows, but are not anticipated to be ready for my use until at least March 2005.

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Second Technical Review

Meanwhile, the technical team has been broadened to encompass a wider group of individuals with a technical interest in working toward the next version of the Phase II recommendations. This team has started from the beginning and undertaken a technical review of all the Phase II steps outlined above, engaged in discussions related to various technical comments received during the draft Phase II review, and reviewed the incorporation of several additional years of fisheries data and supporting analyses. Although this second full technical review has yet to lead to any substantive alteration of the analyses (nor do I anticipate any), I keep in mind that the public as well as the National Academies of Science will review the updated Phase II work.

What other people perceive is, of course, dependent on their viewpoint, frame of reference, and state-of-mind when observing an event. In some way, I hope that this article has helped to reduce the existing perceived differences in views based on a fuller understanding of the facts at the center of the event. In my subjective opinion, the *Hardy Phase II* work and resulting recommendations when compared to national and international standards clearly employed the best available scientific methods under an intense peer review process. For those who continue to hold a different view, I would suggest that in this context denial is not a river in Egypt, but an intransigent position to keep their perceptions consistent with their existing frame of reference.

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Mr. Vogel's Response:

re: the importance of different perspectives and stakeholder involvement

"Facts"

Science?

As an initial matter, there appears to be a considerable difference in opinion among some as to what constitutes a scientific "fact" regarding Klamath River technical issues. For instance, presenting draft study results or draft computer model outputs at a science conference or in a publication does not necessarily make the information factual. Additionally, simply because a person works or contracts for a natural resource agency, doesn't mean that what the person writes constitutes reliable scientific fact. Scientists are generally vigilant to ensure there is a distinction between what may be considered a fact, hypothesis, opinion, or conjecture. To date, much of the technical debate on Klamath River instream flows for fish has focused on differences in scientific opinions, not facts. In particular, some individuals have adopted the strategy: "If you say it enough, it will become a fact."

Agency Attitudes

For example, several years ago, I recall a Klamath River Task Force meeting where a heated debate ensued between the California Department of Fish and Game (DFG) and the US Bureau of Reclamation over an issue on Klamath instream flows. An individual from the DFG expressed the belief that a document with DFG letterhead should have been considered the authoritative "best available scientific information" — and therefore a scientific "fact" — instead of discussing the possible technical merits of the letter's contents. That type of attitude is prevalent and has constrained scientific endeavors on the Klamath River. Agency policies and positions can get in the way of productive scientific inquiry.

Research Questions

It is usual and customary for researchers to clearly articulate their methods and openly display results of data collected in their research. This allows other scientists to determine if the results and conclusions can be appropriately derived from the methods employed and perhaps replicate the research to help corroborate or refute the original investigation. The fundamental nature of science is to always question, seek new knowledge, and find different ways of studying natural phenomena, a philosophy that has not been embraced by all on the Klamath River.

Instream Flow Modeling

Modeling Issues

Much of the recent Klamath instream flow debate has centered on simulating how fish may respond to hypothetical flow scenarios. Some involved parties have used draft computer model outputs from the recent instream flow study in an attempt to justify very high instream flows in a region where it is unproven that historical flows have limited fish populations. Among numerous reasons, the topic is subject to debate because the technique of modeling how fish interact with riverine hydraulics is in its infancy. Often termed a "paper fish exercise," meshing computer modeling of hydraulics with predicted fish behavior is an evolving endeavor. Human interpretation of fish behavior is limited by the difficulty in collecting unbiased, meaningful data on fish in a natural setting. This is why instream flow modeling efforts are sometimes termed "state-of-the-art" and not portrayed as the final definitive tool to accurately quantify flows for fish. Also, models can be easily manipulated to derive different outcomes and,

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consequently, the outputs can be subject to widely different interpretations. Model parameters can be "tweaked" to have the outputs show what one wants to see; the results are only as good as the underlying assumptions. To date, some of the biological principles on the Klamath flow study have been highly questionable and, therefore, the model outputs have been justifiably suspect.

Bias / Mistakes

There are reasons why modeling fish behavior is a complex task. Observations of fish in a natural, existing riverine environment are difficult, let alone predicting fish behavior in future, changed hydraulic conditions. For example, during the *Hardy Phase II* fish data collection effort, the workers understandably had major difficulties in sampling the large river and were greatly constrained in their ability to acquire biological data for the study. Based on conducting underwater observations of fish in dozens of rivers for more than two decades, I and others believe important mistakes were made in the Klamath fish sampling program that resulted in significant, but unintentional, bias. Use of alternative sampling and observation techniques could have minimized that problem. This is one reason, among several, why some initial biological assumptions on the Klamath River are so radically different from the enormous preponderance of scientific research performed on other rivers.

Limited Documentation

Importantly, written documentation of the principal fish sampling effort and data collected years ago for the flow study has yet to be completed even in draft form (only generally verbalized). Given that circumstance, it's difficult to see how a report on the overall instream flow study dependent on those data can be considered "peer reviewed" and factual. It is proper scientific protocol to first disclose the detailed methods and data before reviewers can judge the scientific and technical merits of a draft or final report.

"Idealized" Flows

To date, the allegations on presumed fish preferences in the Klamath River have resulted in draft computer-modeled "idealized" or "optimized" fish flows that are so high as to flood over the river banks into the terrestrial vegetation. According to preliminary analyses, that circumstance, if implemented, would cause the river flows to be seasonally higher than would be naturally available, absent storage in reservoirs. I suspect that further examination will reveal that, given ESA constraints in the Upper Basin previously mentioned, there is insufficient water storage and natural flows to meet all the perceived needs for fish in the watershed. If the computer modeling exercise ultimately results in such an outcome, it will do nothing to advance pro-active efforts toward conflict resolution in the Basin. Indeed, instead of performing the flow study, it would have been more cost-effective for those advocating the high instream flows to simply demand the entire water supply in the drainage. It's also important to emphasize that the instream flow study is only one facet of a multitude of issues facing the Klamath Basin today. There has yet to be a serious comprehensive effort to bring together the diverse interest groups toward problem resolution.

Artificial Crisis

Interestingly, the Upper Basin and Lower Basin water needs were (arguably) satisfied for nearly a century until an artificially-induced ESA regulatory crisis created the present conflict. In that time, there have been years of high salmon runs and productive agriculture. As previously described, no one has yet to demonstrate that the historical mainstem Klamath instream flow regime has been a factor limiting the fish populations; other factors have been considered to be of overriding importance.

Benefits of Different Perspectives (Scientific and Otherwise)

Justification?

It may be comforting to be surrounded with like-minded individuals that eagerly approve one's work, as long as the outcome is mutually agreeable. Whether it is real or perceived, many of the involved agencies in the recent Klamath flow study are believed to be advocates for higher flows without supporting scientific justification. Having previously worked for the US Fish and Wildlife Service for 14 years, my experience is that the agency rarely admits mistakes or changes its position on hotly contested resource topics, even when confronted with new, valid scientific information contradicting the agency's position.

Advocacy Shortcomings

The potential problem of advocacy among scientists has been described by others:

"An attempt by the scientist to simultaneously be a science information provider and a position advocate is an inherent conflict of interest." Mills (2001)

"Finally, the public should be wary of salmon technocrats offering policy positions under the guise of science. Many salmon technocrats have strong personal views on the desirability of restoring wild salmon runs to the Pacific Northwest, but such beliefs reflect personal values and preferences, not scientifically derived conclusions. Embellishing such personal views with the language of science adds a deceiving veneer of credibility." Lackey (2000)

Scientific Precepts

Although it is a view not shared by all, I believe the advocacy approach violates the basic precepts of science. A researcher must be his/her own worst/best critic. Additionally, for issues of major importance, the researcher should actively seek other viewpoints and must be willing and accepting of receiving technical critique of their work (ideally, constructive), even if the comments are diametrically opposed to the original research results. No scientist wants to admit their progeny is flawed, but that is a great

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Objectivity

benefit of effective peer review: preventing non-objective parental affection to one's work. This does not mean that a scientist must accept all technical criticisms, only those well-founded in scientific principles. For example, it wasn't until release of the NRC's final Klamath report that the technical underpinnings of alternative scientific perspectives from the status quo on the Klamath saw the light of day. There were many individuals that did not welcome the NRC's final report. However, both favorable and unfavorable reviews must be examined with objectivity to ensure the least-biased product useful to other scientists and decision-makers.

Inherent Problems

Recent inclusion of other participants into the last part of the instream flow study efforts, although a welcome gesture (albeit overdue), does not resolve the most important and inherent problems. The study's design, assumptions, selection of sampling sites, and methods were already decided and field data were already collected making it too late to correct mistakes made in the early phases. There are three important reasons why other interests and scientific perspectives would have been valuable in the early portions of the study. It could have: 1) helped to prevent inadvertent bias in early study phases that would carry through to the end product; 2) made it difficult for other stakeholders to criticize after the fact if they had been part of the process early on; and 3) developed the critically important element of trust among diverse stakeholders. In the Klamath flow study, this omission wasn't a matter of oversight or lack of stakeholder interest. In fact, other key stakeholders were purposefully excluded from those early, essential phases of the field study. In this regard, I believe the flow study effort started on the wrong foot and was a serious policy mistake caused by the federal government, not by the study's participants.

Brainstorming Needed

Clearly, another more integrated and inclusive approach for the Basin is needed to resolve the perceived or real conflicts for water. What's currently lacking in the Klamath Basin is group brainstorming among a broad diversity of individuals, stakeholders, and disciplines. It can be a productive tool in developing solutions to environmental issues. Such an approach can bring out fresh new perspectives and serve as a catalyst toward a wider range of innovative alternatives than if only a limited number of people are involved (Vogel 1992). After decades of controversy in California's Central Valley, agencies and stakeholders embarked on a different path than that followed on the Klamath. State and federal agencies (CALFED) found that it was essential to include all the key stakeholders in the process of resolving conflicts over water. As a result, because of this collaborative endeavor, major efforts are underway in the Central Valley on ecosystem restoration and water supply improvements, among other measures. I and others (e.g., NRC Klamath science committee, Klamath Water Users Association) have suggested this CALFED-type of approach for the Klamath Basin because doing so would greatly increase the chances of conflict resolution. CALFED identified six "solution principles" which guide their program: affordable, equitable, implementable, durable, reduce conflicts in the system, and no significant re-directed impacts. None of these elements can be used to characterize the recent course on the Klamath. Actually, one could argue that the Klamath has been operating under the opposite six principles.

Inclusion

"Solution Principles"

In conclusion, I have found that the Basin is composed of numerous stakeholders and interest groups each having their own legitimate claim in the Basin's resources and serious beliefs in how those resources should be managed. For example, Lower Basin groups have a well-founded, long-term stake in the fishery resources, whereas the Upper Basin stakeholders have a well-established basis in land stewardship. Regardless of the stakes or beliefs, they are valid, not right or wrong. Periodically, some of the groups attempt to bridge their differences and work toward a common goal. But, unfortunately, some other interest group or agency subsequently uses a legal, political, or regulatory mechanism to often derail that proactive approach and resorts to a strident, divisive stance. Barring some media outlets that appear to relish portraying a "fish versus farms" controversy, the true stakeholders sometimes attempt to resolve their differences at the ground level using a bottom-up approach. They should continue to advance in that direction because the top-down government method has not functioned well. It's difficult to resolve conflicts when only one side is sitting at the table.

Bottom-Up Approach

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Klamath Science

Tributaries' Importance

Coho Habitat Assessment

Tenets

Facts

Coho in Main Stem

Dr. Hardy's Response to Mr. Vogel's Initial Article:

Mr. Vogel does an excellent job in highlighting the complex nature of water allocation issues throughout the entire Klamath River Basin. In particular, I concur with Mr. Vogel that unless tributary issues affecting the anadromous stocks are resolved, the prospects for recovery will remain tenuous. I will not comment here on issues he discusses pertaining to the Upper Klamath Basin since the focus of my article is *Hardy Phase II*. Specifically, I will focus on the elucidation of facts that, once understood, jeopardize the foundation underlying Mr. Vogel's tenets and criticisms related to *Hardy Phase II*.

Mr. Vogel asserts: "*Hardy Phase II* lacked sufficient data to quantify physical habitat suitability characteristics for coho fry and, alternatively, used Chinook salmon fry as a surrogate for the threatened species. Because of this scientifically weakened circumstance and incorrect assumptions on the species' life history attributes… ."

Factually, insufficient data existed to develop site-specific habitat suitability curves for coho fry, so a review of available literature curves was undertaken. These data were reviewed and the corresponding habitat suitability envelope curve for coho fry were utilized for the analysis of coho fry physical habitat (see *Hardy Phase II* Pages 136-138 for source data and final envelope curves for coho fry). In no circumstance was chinook fry utilized as a surrogate for coho fry. The *Hardy Phase II* report makes no "incorrect" assumptions regarding differences between coho and chinook fry life history traits and indicates: "… based on the simulation results for chinook fry and coho fry, and known life history strategies, we believe that the simulation results to be competent to use in the instream flow evaluations. Habitat simulation results for coho closely parallel the results shown for chinook fry in terms of the spatial distribution and magnitudes of suitable habitat." (See *Hardy Phase II* Page 186.)

In the remaining paragraphs of this section of Mr. Vogel's article, he cites to a number of studies to support his tenets of "...incorrect assumptions on species' life history attributes..." that coho utilize habitats "…that possess characteristics not found in the main stem Klamath River …very few coho fry use the main stem. This should have been recognized as an irrefutable biological fact… ." He goes on to assert that *Hardy Phase II* determinations were "…Lacking supportive scientific data and, more importantly, ignoring scientific data developed in the Klamath basin and other watersheds…"
Vogel then follows with these three tenets:

"1) The potential importance of coho rearing habitat in the main stem river was not empirically established through scientific research.

2) The biological opinion was in contrast to the preponderance of scientific evidence developed in other rivers and streams and the known widespread ecological regularity of rearing habitat characteristics for coho salmon.

3) The main stem Klamath River immediately downstream of Iron Gate Dam does not contain the known habitat attributes preferred by coho based on the available data. (Vogel 2003)" (End quote) (Please note: Vogel (2003) has not been peer reviewed and contains data mainly from the Sacramento River.)

I am reminded of Sergeant Joe Friday in the classic television show Dragnet. When seeking the truth from a witness would say "All we want are the facts, ma'am."

Mr. Tom Shaw, a Supervisory Fishery Biologist in the Arcata US Fish and Wildlife Service (USFWS) Office was kind enough to provide the following facts:

- Coho spawning was observed in the main stem Klamath River in 2004 at locations similar to surveys conducted in 2001.
- In 2004, redds were located in the main channel, split channel, and side channel areas of the main stem Klamath River, with the majority located between Iron Gate Dam and the Scott River.
- Coho fry have also been captured in chinook sampling efforts at traps in the main stem Klamath River located below Bogus Creek, the I-5 Bridge, and above the Scott River confluence.
- In 2002, over 4,000 fry were captured at these three locations.

Based on juvenile chinook sampling efficiencies, it is estimated that a total of over 1.2 million coho *fry* passed these three combined trapping locations, yet Mr. Vogel asserts '… very few coho fry use the main stem.' During the chinook fry electrofishing surveys, USFWS have also noted numerous coho using the edge-water habitats in the main stem cohabitated by chinook fry/juveniles. I am not disputing Mr. Vogel in that the main spawning and rearing of coho occur in tributaries, however, one cannot ignore coho in the main stem Klamath River in the face of these facts and in particular in light of their listed status under the Endangered Species Act. Nor can one ignore that they are utilizing many of the same habitats as chinook fry/juveniles, which supports the assumptions and modeling approaches utilized in *Hardy Phase II.*

Klamath Science

NRC Quote

Mr. Vogel (as well as others) anchor many of their tenets on this quote from the National Research Council's (NRC's) final Klamath report which states:

"The committee saw the modeling [*Hardy Phase II*] approach as flawed by heavy reliance on analogies between habitat requirements for Chinook salmon and habitat requirements for coho salmon. Habitat requirements for Chinook salmon are better known, but the behavior and environmental requirements of Chinook salmon differ substantially from those of coho salmon. To the extent that this approach is carried forward into the final report, the NRC committee's skepticism about the validity of the analogy would also be carried forward."

NRC Mistaken

With all due respect to Mr. Vogel and the NRC Committee, it is a factual matter (if you read the report) that *Hardy Phase II* <u>never</u> utilized chinook habitat requirements for coho habitat requirements in any analogous manner (or for any other species or life stage for that matter). The Committee (and Mr. Vogel) simply got it wrong. Different habitat suitability curves for each species and life stage were used to develop species and life stage specific habitat versus flow relationships subsequently used in making the flow recommendations. It is interesting to note, that when I presented '*Field Validation of Habitat Modeling in the Lower Klamath River*' (i.e., *Hardy Phase II*) at the Lower Klamath Science Symposium (Humboldt State University, June 7-9, 2004) Dr. Peter Moyle who was a member of the NRC committee cited above, approached me after the talk and made the following comment: "That was brilliant and needs to be published in the peer reviewed literature." His words not mine!

Ample Peer Review

Mr. Vogel further asserts that the "NMFS's 2001 biological opinion was flawed by misuse of the preliminary study results …" and that "... the draft study report had not yet been issued for external review." He further lays claim to this "lack of peer review" in regard to the NMFS's 2002 biological opinion for the Klamath Project operations. In fact, at the time of the NMFS's 2001 (and 2002) biological opinion(s), the modeling results up to and including the relationships between flow and habitat for each species and life stage had undergone extensive and critical review as highlighted in the body of my article. Contrary to Mr. Vogel's opinion, I believe that given the level of critical technical review that the *Hardy Phase II* work was subjected to prior to NMFS' formulating their biological opinions, that NMFS in fact relied on "the best available commercial and scientific data."

Iron Gate Releases

Mr. Vogel puts forward the tenet that no scientific evidence exists that would support the contention that higher flow releases below Iron Gate Dam would be of any substantive benefit to the fisheries. In his words "Despite all the scientific research and funds expended on the Klamath River, no entity has developed any data to support the premise that specific Iron Gate releases over the past several decades has been a significant factor limiting Klamath River salmon populations." Au Contraire, mon amie! In my analysis of the flow regimes below Iron Gate Dam in *Hardy Phase II*, which considered both physical habitat and water quality, I concluded that the "… assessment of the temperature simulation results is that flows below 1000 cfs exacerbates these deleterious temperature conditions and places the anadromous species at greater ecological risk." (*Hardy Phase II*, Page 242).

Temperature Assessment

Importance of Flow Levels

Mr. Vogel further postulates that to resolve these disparate views of the importance of flows within the main stem Klamath River that "Carefully controlled experiments conducted by tagging and releasing juvenile fish under different water operational scenarios would be valuable to test hypotheses of potential effects of flow and resultant survival and recruitment to the adult life phase." One might argue that just this type of experiment has been conducted (sans juvenile tagging) within the main stem Klamath River although the "Law of Unintended Consequences" ultimately determined the outcome. In August of 2002, flow releases below Iron Gate Dam were 666 cfs (a scary number for sure) and then rose to 767 cfs during early September. Both flow levels were well below my ecological risk flow level. By mid-September, the largest recorded fish kill in the history of the Klamath River occurred where it was estimated that over 30,000 (including coho) anadromous fish literally went belly-up. The primary management response was to increase the releases below Iron Gate Dam to 1,300 cfs in an effort to abate the fish kill. I would submit to the reader (and Mr. Vogel) that this is pretty strong empirical evidence that flows (at times) do make a difference in the main stem Klamath River.

Real World Evidence

Conclusion

Holistic Approach Agreement

Aside from these contentious issues regarding different perceptions and points of view highlighted above, I believe that Mr. Vogel and I are of one mind. Specifically, the most fruitful way forward to resolve water allocation issues in light of salmon recovery efforts is to take a holistic approach where the Klamath Basin is viewed in its entirety. Furthermore, I agree with Mr. Vogel, that the way forward will be best served by collaborative efforts aimed at understanding the science rather than continuation of the polarization that arises within the litigation arena.

Finally, I leave the reader with a quote from Mark Twain: "Researchers have already cast much doubt on the subject and if they continue their studies we shall soon know nothing at all."

MONTANA WATER LAW UPDATE

by David C. Moon, Editor

The 4th Annual Montana Water Law Conference, presented last October in Helena by the Seminar Group, provided an excellent array of expert speakers who brought attending Montana water professionals up to speed on the latest developments in Montana water law.

LEGISLATION IN THE 2005 SESSION

Adjudication Bill

Water Adjudication Fee Bill

Proposed Montana House Bill (HB) 22 has been drafted to provide funding for Montana's statewide adjudication of water rights. Montana's adjudication process has been on-going for decades (your author got his start in water law preparing claims for this adjudication in 1980). Montana's adjudication includes all pre-1973 water rights in the state (approximately 220,000 claims), since Montana did not institute a permit system until 1973. [See Moon, TWR #2.]

Fee Amount

As proposed, the bill would require a payment of $10 per water right per year, with a maximum payment of $200 per year by the water user. Higher fees are planned for commercial, industrial, mining, municipal and power generation uses, depending on the volume of those uses. The bill contains a provision that allows the Montana Department of Revenue to file a lien against the water right if the fee "debt" is not paid. The fees would be collected every other year and have a total cap of $31 million. Even if this cap is not reached, the fee is designed to sunset at ten years. A yearly maximum expenditure is set at $2.6 million. No fee will be imposed on federal water rights, tribal reserved water rights, or aboriginal water rights.

"Debt" Lien

Sunset

Benchmark Review

A major contingency contained in the fee bill is that the Legislation must continue committing an additional $2 million per year to the adjudication. The legislation also contains performance "benchmarks" for the examination of claims by the Montana Department of Natural Resources and Conservation (MDNRC) that must be met for the fees to continue to be assessed.

The fees are based on the amount estimated to finish Montana's adjudication in 15 years, with a plan to hire 30 additional MDNRC employees. It is expected that the Water Court would hire three new "Watermasters" (Water Court adjudicators who make decisions on the claims), plus one staff person.

Outdated Data

A major problem that was discussed at the conference was the outdated database of water right ownership in MDNRC's records. The fees are designed to generate $1.3 million/year, but the legislation contains no contingency or funding to collect the fees or update records. MDNRC's addresses for water right owners is undoubtedly inaccurate to some degree since, like many western states, there is no mechanism to keep agency records current.

"Verification" v. "Examination"

As initially drafted, the bill requires examination of all irrigation claims in basins that were "verified rather than examined." Earlier in the adjudication process, some claims were merely "verified" or reviewed by the MDNRC — as opposed to basins where the claims were "examined" by MDNRC pursuant to rules adopted by the Montana Supreme Court. As a practical matter, in basins where claims were "examined" by MDNRC, the result was that significant "issue remarks" were added by MDNRC to point out potential problems or questions as to the legitimacy of the claims. Water users reviewing the decrees that were issued by the Water Court could look to these "issue remarks" as a shortcut to discover problems to which they might wish to file objections. Krista Lee Evans, Resource Policy Analyst for the Legislative Services Division (contact information below) noted that an alternative to examining all unexamined basins is still under consideration. This second option would examine only those basins where 15% of the users in a basin petition for examination.

"Issue Remarks"

Impacts

Questions were raised about possible impacts on existing (previously agreed upon) claim stipulations entered into during previous stages of the adjudication should MDNRC examination now occur. One conference attendee noted that some stipulations that have been agreed to are contrary to historic use, but were nonetheless entered into in order to settle a case.

Controlled Groundwater Areas

GW Areas

Another bill has been drafted based on a request from MDNRC to revise "controlled groundwater areas" statutes. Jack Stults, the head of the Water Rights Division of MDNRC, mentioned two dynamics that are involved. Currently, where the agency does not have enough information to warrant a permanent controlled groundwater area (common situation in Montana), the statute requires implementation of a temporary controlled groundwater area that requires new users to go through a permit process. MDNRC is seeking new language that would give them more flexibility so that a permit could be required, but would not be mandatory. MDNRC would also prefer the costs of groundwater studies to be borne by those area-petitioners requesting the controlled groundwater area designation.

Montana Water Law
"Correct & Complete"

Use Standards

Conjunctive Use

MDRNC Responses

Water Market Impediment

Re-Adjudicate?

Instream Rights

"Murphy Rights"

"Reservations"

Judicial Recognition

Bean Lake III

Reservoir Releases

COMPREHENSIVE WATER RIGHT RULEMAKING COMPLETED

Kim Overcast, the New Appropriations Program Manager of MDNRC, gave a presentation regarding agency rulemaking on standards for "correct and complete" applications and "correct and complete" objections. To address the poor quality of applications submitted by the public, MDNRC has completed extensive, comprehensive rule changes. These new requirements must now be met for an application to be deemed "correct and complete." The new rules affect nearly all of MDNRC's actions and standards regarding water rights. The rules include provisions for evaporation standards, land descriptions, map criteria, and general water use standards limiting the specific use applied for. Deviations from the specific standards are allowed if the applicant provides information adequately supporting the deviation.

The new rules also address a prominent Montana controversy regarding conjunctive use of groundwater and surface water by changing the definitions of "hydraulically connected" and the definition of the standard "immediately or directly connected to surface water."

On December 16 in the Montana Administrative Register, MDNRC issued revised Administrative Rules of Montana (ARM) following a hearing and comment period. The revised rules are posted on their website at www.dnrc.state.mt.us/wrd/home.htm; click on "Notice of Adoption - In the matter of the amendment of ARM 36.12.101." This posting is particularly valuable for water professionals in that it contains comments filed on the proposed changes and MDNRC's responses.

Another speaker at the conference, David M. Schmidt, the Senior Water Right Specialist of Water Right Solutions, Inc., believes that the proposed rules represent new impediments to the development of water markets in Montana. Schmidt said that the rules result in great expense to applicants seeking to change a water right and essentially create a process that duplicates the work of Montana's Water Court by requiring the re-adjudication of the underlying water rights. Although the rules were revised from the version Schmidt based his comments on, language remains that says "Final water court approved stipulations, master's reports or examination information related to the water right being changed must be submitted with the application, however, this information or an abstract of a water right from the department or the Montana water court by itself is not sufficient to prove the existence or extent of the historical use." See ARM 36.12.1902, Change Application - Historic Use.

ENFORCEMENT OF INSTREAM WATER RIGHTS IN MONTANA

Bill Schenk, the Instream Flow Specialist for the Montana Department of Fish, Wildlife and Parks (MDFWP), discussed enforcement of instream water rights at the conference. Instream water rights in Montana come in a variety of forms. "Murphy Rights" (named after the concerned legislator) were created by legislation that allowed MDFWP to file on unappropriated water in portions of twelve of Montana's highest quality "Blue Ribbon" trout streams — these rights have priority dates of December 1970 or January 1971. The Murphy Rights were submitted as claims in the Senate Bill 76 Adjudication of all pre-1973 water rights in Montana. "Reservation" instream rights were filed by MDFWP for the Missouri River Basin and the Yellowstone Basin, with priority dates of July 1, 1985 and December 15, 1978 respectively. Reservations do not go through the adjudication process, but must be reviewed by MDNRC once every ten years to determine if the reservations have been put to use. Reservations may be revoked, modified, or extended following the MDNRC determination.

"Judicially Recognized Rights" are the third form of instream water rights with three stream segments and one lake recognized by the Water Court to date (approximately 192 government instream and inlake claims filed in the adjudication process and an additional 422 such claims filed by individuals in the adjudication are pending). Schenk said that the Montana Supreme Court case known as "*Bean Lake III*" fortifies the "Judicially Recognized Rights" since that case was the first time Montana's highest court formally recognized that instream water rights developed by historic use could be valid [See Moon, TWR #2.]. In *Bean Lake III*, the Supreme Court found that fish, wildlife and recreation claims could be valid, either with or without a diversion. For MDNRC's summary regarding *Bean Lake III* and its impact on instream water rights, see http://www.dnrc.state.mt.us/wrd/home.htm. [To find out if a water body has an instream flow right in Montana, go to MDFWP's website and navigate to the Montana Fisheries Information System: http://maps2.nris.state.mt.us/scripts/esrimap.dll?name=MFISH&Cmd=INST]

Schenk noted another form of instream right — involving the release of stored water — recently developed with the help of Trout Unlimited. A total of 15,000 acre-feet of water out of Painted Rock Reservoir has been allocated to instream flow. He expects additional development of this type of right, possibly tied-in with expanded reservoir storage, in the future.

Montana Water Law

Instream Leases

Limited Term

Enforcement

P.O.D. Basis

1973

Warning Letters

"Objection" Process

Permitting Ponds

Montana has also ventured into the realm of water leases and conversions for instream flows with a pilot program. Currently, MDFWP has 15 active instream flow leases (see Section 85-2-436, Montana Codes Annotated (MCA)). The leasing statute was enacted as a "water leasing study" for the period 1989-2009 and limited to 40 streams. It represents the only method for MDFWP to "change" an appropriation right into an instream flow right. In most cases, lease terms are limited to 10 years — but they may be renewed once for up to 10 additional years. The exception to this is a lease of "saved water" resulting from the development of a water conservation or storage project. This type of lease is restricted to a term equal to the expected life of the project (but not more than 30 years). [See Section 85-2-436 (2) (f), MCA.] A bill has been drafted for the 2005 Montana Legislature that would remove the termination date for the pilot program and make the instream flow leasing program permanent.

MDFWP can request enforcement to protect its leases. Schenk's presentation noted that so far MDFWP has been focused on finding leases that are not likely to require much enforcement effort, either by leasing a right with an undisputed senior priority date (and solid history of enforcing the right) or based on the instream right's location on the stream. The maximum quantity of water that may be leased is the "amount historically diverted," but "only the amount historically consumed, or a smaller amount if specified by the department in the lease authorization, may be used to maintain or enhance streamflows *below* the lessor's point of diversion." Section 85-2-436 (2) (e), MCA (emphasis added). Due to this statutory limitation, enforcement against upstream junior rights can be demanded for the same flow that was historically diverted, while enforcement against downstream junior rights is limited to the amount of water that was historically consumed. Montana's system in this regard contains both a "paper right" element (full extent of the historic right) and a "consumptive right" element (amount consumed).

Montana's permit system was not instituted until 1973. In general, enforcement of water rights in Montana is largely the responsibility of the owner of the water right. For post-1973 water right holders the administrative agency (MDNRC) only becomes active in enforcing water right violations when a complaint is made. For pre-1973 water rights, the water right holder must either: 1) file a complaint in district court to enjoin junior water users (Section 27-19-101, 201, 314, MCA); or 2) go through the duly-appointed "water commissioner." The water commissioner is a private individual hired by the water users on a specific ditch system. Hiring a water commissioner becomes an option if the concerned water rights have been decreed by a court (pursuant to Section 85-5-101, MCA).

Schenk pointed out that to protect its instream rights the MDFWP must be diligent in enforcing its rights in order to maintain their integrity. MDFWP's approach is to monitor snowpack and weather conditions and when conditions warrant MDFWP sends the junior water right owners a letter warning them that low stream flows are expected and that at some point MDFWP may request diversions to cease. The Montana Drought Response Plan states that warning letters are to be sent by June 1. When stream flows fall below the MDFWP instream right, MDFWP will "call" junior water rights and tell them to stop their water use. The letters reference a stream gauge and an Internet site where the user can determine whether they could lawfully resume use (if the stream level rises above the cutoff point). As noted above, MDFWP like any other water user, would have to resort to the district court or a water commissioner if the informal "call" is not heeded.

MDFWP may enforce its instream rights by participating in the "objection" process. MDFWP looks over every new water right permit application and change of use application filed to see if issues exist, according to Schenk. He noted, however, that in 2004 MDFWP reviewed 100 applications and only filed one objection. As an instream water right holder, MDFWP's standing to object is clear. Schenk cited Section 85-2-308, MCA on "Objections" which states that a "person has standing to file an objection...if the property, water rights, or interests of the objector would be adversely affected by the proposed appropriation." Schenk said MDFWP is "more hesitant to object where there is no instream water right."

MDFWP is reluctant to participate in Montana's adjudication process as "an institutional objector in Montana Water Court to claims." MDFWP is "not sure we want to do that because of the major political heat" that would undoubtedly result, according to Schenk. A conference participant from MDNRC said that MDNRC would like to see MDFWP "object" in the adjudication process — as well as "call" its rights — where necessary to protect instream water rights.

PRIVATE PONDS: PERMITTING AND CONSTRUCTION ISSUES

Karl Uhlig, water rights specialist with Land & Water Consulting (Missoula, Montana), provided practical insights into groundwater and wetland permitting issues as they relate to Montana law and the US Army Corps of Engineers' criteria under Section 404 of the federal Clean Water Act. Uhlig first emphasized that before starting construction on a pond or wetland project, it is necessary to have both a good design and all the necessary state and federal permits.

Montana Water Law
GW Source

Augmentation Plan

Consumptive Use Standard

Piecemeal Adjudication

New Enforcement

Prior History

New Impacts

Stockwater Claims

Obtaining a water source when a fully-appropriated basin has been "closed" to new surface water appropriations is an issue which arises frequently in Montana. Turning to a groundwater source may be an option if groundwater is physically and legally available. In Montana, groundwater is legally available if it is not "immediately or directly connected" with a surface water body in a closed basin (see ARM 36.101.12(33) for new definition). "Changing" a water right to provide some or all of the water source may be another option. Uhlig stressed that every site is different and permitting requirements will vary. He cautioned against "over-engineering" a site. He referred to the "Landowner's Guide to Montana's Wetlands" (available at www.mtwatercourse.org) as an excellent source of information.

MDNRC considers ponds to be a consumptive use. Uhlig noted that one usually needs an "augmentation plan" — i.e. a source of water to make up for a pond's losses due to evaporation. If the proposal is to "change" an irrigation water right to enable use of the pond, the user will need to curtail irrigation to an extent sufficient to supply pond usage. Uhlig emphasized that Montana's standard in such a situation is to determine the consumptive use of the crop involved, not the amount of water diverted to irrigate the land (i.e. the "consumptive use" standard).

MUSSELSHELL RIVER ENFORCEMENT PROJECT: EFFECTS & LAND VALUES

Montana is grappling with how enforcement of water rights will occur following its adjudication process that has been on-going since the late 1970's. A permit system was instituted in 1973. Montana's adjudication process is determining pre-1973 water rights. That "general stream adjudication" (Montana's adjudication) is essential since it has been impossible for water users to obtain enforcement of their priority dates (and thus receive water they are entitled to), except in cases where a previous water dispute resulted in a decree from a state district court that included all the parties who are using the disputed water. If such a decree exists, a "water commissioner" can be appointed for regulation — but only the water rights specifically included in that decree can be regulated. This history of piecemeal adjudication meant that while some localized conflicts were resolved, water rights as they related to each other throughout a river basin were still not subject to any formal control. The MDNRC could not act as enforcement body for any water rights with priority dates prior to 1973, i.e. they could only enforce as to permitted water rights. The "Musselshell River Enforcement Project" is the first attempt to utilize newly-decreed water rights arising from Montana's adjudication process. The Project is currently being administered under a "Temporary Preliminary Decree" (to be followed by a "Preliminary Decree" and eventually a final decree) to allow the MDNRC to act as the enforcement body for the entire length of the Musselshell River.

Jim Moore, a recognized water law expert in Montana, spoke on the new enforcement regime for the Musselshell River in central Montana. Moore's expertise also includes experience as a long-time irrigator in the Musselshell River Basin on his family ranch ("Two Dot Ranch").

Prior the Temporary Preliminary Decree, the Musselshell River had no historic court decree to guide enforcement of water rights basin-wide. Because of that fact, the Musselshell River (with over 200 miles of length) did not have *any* history of control or regulation of water rights pertaining to its entire length. Nonetheless, its physical history is that it was de-watered in various reaches, with some portions replenished by flow from tributaries. The valley was settled from west to east. The first water right was established on the North Fork of the Musselshell in 1875 and numerous other upper river water rights (or rights on upper tributaries) were established shortly thereafter. In Montana's adjudication process, two claims for small rights on the lower and middle reaches of the river claimed priority dates in the 1880's. Three storage reservoirs were constructed in the 1930's that effectively stabilized river flows and ended de-watering of the river, at least in the upper and middle reaches.

The "Musselshell River Enforcement Project" is a program developed to utilize the latest decrees from Montana's Water Court (adjudication) to regulate water rights (see website at: http://lmcd.mt.nacdnet.org/MREP/). According to Moore, however, the experiment has gone badly awry with the new enforcement greatly changing the way water is regulated in the basin. Moore said that when the 1973 Water Use Act was passed creating the permit system and setting the adjudication process in motion, it was intended to lock in the status quo and allow water use to move forward. The practical effects of the adjudication with the new enforcement program, however, have changed land values dramatically. For the first time, water users in the upper basin have had their water rights curtailed in the new enforcement program to satisfy lower basin users.

Stockwater rights could be claimed in Montana's adjudication. Some water users filed stockwater claims while many did not. As far as objections were concerned, essentially no one objected to stockwater claims. In the Musselshell River Basin, however, the MDNRC is now regulating in favor of an 1880 stockwater right at the lower end of the river, requiring water users with rights junior to 1880 to

Montana Water Law

Historic Use Differences

Abandonment

"Futile" Call?

cease irrigation some eighty river miles upstream, as well as on tributaries to the Musselshell River. Vast quantities of water must be left instream and not diverted to enable delivery of water to the stockwater right downstream, *contrary* to historic use patterns according to Moore.

Some of the early irrigation rights downstream also were not historically satisfied due to use upstream and the long distances to the downstream place of use. Moore posed the question "Were these downstream rights basically abandoned or subordinated, if water users were not receiving their water rights yet never took steps to enforce them for over 120 years?" As Moore also noted, in the adjudication process water users examined their neighbors' claims and claims of other users in the vicinity, but few irrigators (or their lawyers) bothered to examine claims that were at a distance remote from their ranches. With the recent enforcement events stirring up controversy, many water users (both upstream and downstream) are considering filing objections to remote claims in the next stage of the adjudication (i.e. the "Preliminary Decree" stage).

Moore questioned whether or not calls for enforcement against upstream water rights to satisfy senior rights far downstream should be considered "futile calls" (unenforceable requests) under Montana water law. Must a "futile call" be based on the complete inability to deliver water to a senior user, or should a "futile call" also be found to exist when an inordinately large amount of water is required to satisfy the senior user far downstream?

FOR ADDITIONAL INFORMATION:

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THE ESA AND WATER "TAKINGS"

$16.7 MILLION SETTLEMENT SHAKES UP WATER WORLD
INTERVIEW WITH ATTORNEY ROGER MARZULLA
By David C. Moon, Editor

ESA Water Takings

Legal Costs Included

The Bush Administration has agreed to pay four California water districts, two general partnerships, and two living trusts $16.7 million to settle a US Court of Federal Claims decision. That decision, *Tulare Lake Basin Water Storage District, et al. v. United States*, 49 Fed. Cl. 313 (2001), found that these water users were entitled to compensation under the Fifth Amendment for water taken from them in 1992-1994 to provide federal Endangered Species Act (ESA) protection for the endangered winter-run Chinook salmon and threatened delta smelt. Some press reports incorrectly indicated that the districts would also receive legal costs in addition to the $16.7 million. Roger Marzulla of the law firm Marzulla & Marzulla

ESA Water Takings Opposition

of Washington, D.C., one of the attorneys representing the districts, told *The Water Report* that the $16.7 million represents the entire settled claim and that it includes all legal fees and costs.

The US Department of Justice settled the case despite opposition to a settlement from environmental groups, the California attorney general's office, and California Governor Arnold Schwarzenegger. All these parties were unanimous in urging the Justice Department to appeal the Court of Claims ruling.

Property rights advocates and critics of the ESA claimed the settlement represented a significant victory. The lawsuit was filed on behalf of the districts by Roger Marzulla and Nancie Marzulla, both of whom served as Justice Department officials during the Reagan administration. Their law firm is also currently pursuing three other "takings" claims, including a $1 billion claim in the Klamath Basin (see below).

Precedent

The Settlement Agreement contains language stating that the *settlement itself* establishes no legal precedent — "this settlement [shall not] be interpreted to constitute a precedent or argument in this or any other case"(paragraph 5). The *Court's decision*, however, may be viewed as precedent setting. Marzulla emphasized that the case establishes the fundamental principal that, while the government is free to protect fish, it also obligated to pay for the water it takes to do so. As Marzulla pointed out to *The Water Report*, "the reported decisions of the court remain on the books."

KLAMATH TAKINGS CASE

Contrasts

Marzulla went on to contrast the California case with a pending "takings" case in the Klamath Basin. The Tulare "takings" case involved water deliveries from a state agency — i.e., the State Water Project of California. The California Department of Water Resources holds the actual water permit and delivers the water to "State Water Contractors" for subsequent distribution. The National Marine Fisheries Service (NMFS) issued a biological opinion (BiOp) concluding that the normal operation of the State Water Project would jeopardize the ESA-listed salmon species, while USFWS issued a BiOP determining that the operation would jeopardize the delta smelt, resulting in restrictions on the time and manner in which water would be delivered under the State Water Project. Water that would have otherwise been used by the irrigators under their contracts was not delivered for use due to NMFS' and USFWS' BiOps.

State Distribution

Federal Distribution

In the Klamath case, the plaintiffs, organized as irrigation districts, have water contracts with a federal agency — i.e., US Bureau of Reclamation (Bureau), which administers the Klamath Project. Marzulla pointed out that Section 8 of the federal Reclamation Act requires that water be appurtenant to the land. Under Oregon water law, individual farmers have a right to receive water that is "appurtenant" to their land once they receive deeds to their land, according to Marzulla. In fact, when the Klamath Project was started in 1905 there were no irrigation districts and the Bureau's relationships were with individual farmers. The US government took title to the land within the Klamath Project and then deeded it out, mostly via land patents. At least some of those early patent deeds from the US government to individual farmers contained specific language citing the use of water from the Klamath Project. Marzulla told *TWR* the following language was typical of those early deeds: "The United States of America, in consideration of the premises, and in conformity with the several Acts of Congress...has given and granted...unto the said [name of grantee]...the tract above described, together with the right to the use of water from the Klamath Reclamation Project as an appurtenance to the irrigable lands in said tract... ."

Marzulla pointed out that in the late 1920's Congress changed the law to require that all future water delivery contracts be made to irrigation districts rather than individuals. In Marzula's view "the districts are just the deliverymen" of the water and the "ultimate owners of the water rights are the property owners." Marzula noted that this interpretation aligns with the clearly established water law doctrine regarding "beneficial use." The individual farmers are the ones with a "beneficial interest" in the water rights as it is the farmers that put the water to "beneficial use"— not the Bureau, Marzulla said.

The Klamath case has recently been assigned to a new judge (Judge Allegra) and a February 14, 2005, status conference has been set to identify the issues that are pertinent to that case.

Additional Takings Cases

The third case Marzulla & Marzulla is pursuing, *Stockton East et al V. United States*, is now in discovery and set for a status conference March 3, 2005. The law firm is also anticipating the filing of a NAFTA case against the government of Mexico for the taking of Rio Grande water.

FOR ADDITIONAL INFORMATION:

ROGER MARZULLA, Marzulla & Marzulla (Washington, DC) 202/ 822-6760 or email: roger@marzulla.com
BLAIN RETHMEIER, US Department of Justice (Washington, DC), 202/ 514-2000

WATER BRIEFS

USFWS REGS NATIONAL
INCIDENTAL TAKE PERMITS

On December 10, the US Fish & Wildlife Service (USFWS) published new regulations covering incidental take permits issued under the Endangered Species Act. The new regulations came in response to an order by the US District Court judge for the District of Columbia ruling that the Service had violated the Administrative Procedure Act by failing to provide the public with an adequate opportunity to comment on proposed regulations. The regulations describe circumstances in which USFWS may revoke these permits. USFWS grants incidental take permits to landowners who have voluntarily agreed to develop Habitat Conservation Plans (HCPs). These plans provide a framework for landowners to conserve threatened and endangered species on their property. In return, the permits give landowners authorization for incidental take of listed species resulting from otherwise lawful development or land use.

While USFWS has not revoked an incidental take permit associated with an HCP to date, the new regulations clarify the limited circumstances when this could happen. This rule allows USFWS to revoke an incidental take permit only if take of listed species caused by the permitted activity will reduce the likelihood of survival and recovery in the wild of one or more of the covered species and USFWS cannot find a remedy to prevent this situation. USFWS deleted the phase "in a timely fashion" from the final regulations because the agency believes that each HCP is unique and it is difficult to define a precise timeframe. Regulations regarding the procedure for making such findings are found in 50 CFR 17.22(b)(5)(iii) and 17.32(b)(5)(iii).
For info: Brian Norris (USFWS), 202/ 219-7499

BULL TROUT LAWSUIT MT/OR
CRITICAL HABITAT DESIGNATIONS

The Alliance for the Wild Rockies and Friends of the Wild Swan conservation organizations filed suit December 15 in Federal Court in Portland, Oregon challenging the federal government's decision to cut critical habitat designations for the threatened bull trout by more than 90%. The draft proposal for the Columbia and Klamath Basins contained approximately 18,500 miles of rivers and streams, and over 500,000 acres of lakes. The final designation contains just 1,748 miles of streams and just 61,000 acres of lakes, including zero designations for the State of Montana. The suit claimed that by slashing the proposed designations by approximately 90%, the government has ignored its own scientists and legal findings. The outcome of the case may set a precedent for how critical habitat for threatened and endangered species is proposed and designated. The groups also announced they intend to charge the government with "engaging in a pattern and practice of unlawful behavior" in minimizing critical habitat designations, once statutory timing requirements are met (60-day waiting period). In a press release, the groups maintained that the government strategy is to produce one-sided economic analyses which only enumerate the costs of critical habitat designations, with no accounting whatsoever for the benefits of healthy fisheries, cleaner water for human consumption and agricultural uses, and increased economic activity through fishing permits and guides. Then, the government cites the costs as reasons to eliminate critical habitat. In the bull trout case, the government purged a 56-page section on economic benefits from a final report, according to the groups.
For info: Michael Garrity (AWR), 406/ 459-5936, website: www.wildrockiesalliance.org; Jeff Fleming (USFWS), 202/ 208-5634

LAND AND WATER USE CA
NEW CALIFORNIA WEBSITE

The California Land & Water Use Portal is a collection of land and water use information put together by the California Department of Water Resources. The Portal is a collection of vital information related to the water used in various human activities. It covers urban, agricultural, and managed wetlands water use, known collectively as cultural water use. These data are critical to water resources planning studies, evaluation of water use efficiency measures and other water management options, and for estimating future water use in California.
For info: CLWU website: www.landwateruse.water.ca.gov/

COLVILLE TRIBES WA
WATER AGREEMENT

Gov. Gary Locke, Colville Tribal Chairman Joe Pakootas and state Fish and Wildlife Director Jeff Koenings signed an agreement on January 4 that will allow the state to obtain intermittent releases of water from Lake Roosevelt, when needed, from April to August each year. The agreement with the Confederated Tribes of the Colville Reservation is an important component of Locke's Columbia River Initiative, a new proposal for managing Columbia River water resources for the next 20 years.

Lake Roosevelt is the reservoir created by Grand Coulee Dam, and forms the southern and eastern boundary of the Colville Reservation. The agreement addresses the effects a new lake drawdown may have on tribal resources, including water supplies, lake fisheries, cultural resources, power revenues, exposure of lakebed contamination and potential harm to other tribal resources.

Under the agreement, water will be released from the lake to support downstream fisheries, irrigation and municipalities, and to ease the effects of drought. The amount of water released will range from up to 82,500 acre-feet (1 foot of lake elevation) during a normal year to no more than 132,500 acre-feet (1.65 feet of lake elevation) during a drought year.

The state's agreement with the Colville Tribes will make water stored in Lake Roosevelt (managed by US Bureau of Reclamation) available to farmers whose rights now may be interrupted during drought and for

future municipal uses. A portion also would be dedicated to improving river flows for fish migration. The Columbia River Initiative identifies some 728,000 acre-feet of water to meet the region's needs for the next 20 years. The plan's water acquisition program would meet the needs of all outstanding Columbia River water right requests pending before the state Department of Ecology and provide a reserve for the region's forecasted water needs. Ecology has filed a rule proposal to govern how the regulatory portion of the water management program would be implemented.
For info: Joye Redfield-Wilder, Ecology, 509/ 575-6210, website: www.ecy.wa.gov/programs/wr/cri/crihome.html; Steve Suagee, Colville Tribes, 509/ 634-2381

SANTA ANA SUCKER CA
CRITICAL HABITAT REVISED

On January 4, the US Fish & Wildlife Service (USFWS) published a revised final designation of critical habitat for the threatened Santa Ana sucker. Approximately 8,305 acres of essential habitat in portions of the San Gabriel River and Big Tujunga Creek in Los Angeles County, California are included in the revised designation. The designation of critical habitat for the Santa Ana sucker was in response to a lawsuit filed against the Service by California Trout, Inc., the California-Nevada Chapter of the American Fisheries Society, the Center for Biological Diversity, and the Friends of the River.

A draft economic analysis was prepared to provide a comprehensive overview of estimated costs associated with the listing of the Santa Ana sucker under the Endangered Species Act and the designation of 21,129 acres of streams in Los Angeles and San Bernardino counties as critical habitat. The draft analysis estimated conservation costs could range from $21.8 to $30.5 million over the next 20 years. Costs associated with implementing conservation measures prescribed in Habitat Conservation Plans and consultations with other Federal agencies were included in the analysis. Designation of critical habitat in the San Gabriel River and Big Tujunga Creek is estimated to result in annualized impacts of $926,000.

Based on a review of areas included in the February 26, 2004 critical habitat designation, and comments and information received on the proposed rule and draft economic analysis, the Service removed several additional areas from critical habitat designation, as follows: Little Tujunga Creek, and portions of the Santa Ana River and its floodplain. These exclusions total about 12,864 acres.
For info: Jane Hendron (USFWS), 760/ 431-9440 x205

LAVACA BAY SETTLEMENT TX
ALCOA AGREEMENTS

On December 10, the Department of Justice, US EPA, NOAA, Department of the Interior, Texas Attorney General's Office, Texas Commission on Environmental Quality, and the Texas Parks and Wildlife Department announced two settlement agreements with Alcoa Inc. and Alcoa World Alumina L.L.C. that address mercury-contaminated sediments in Lavaca Bay, ongoing unpermitted discharges of mercury into Lavaca Bay, and soil contamination at the Point Comfort/ Lavaca Bay Superfund Site. The NOAA Damage Assessment and Restoration Program served as the Lead Administrative Trustee coordinating the development of Restoration Plans and other aspects of the injury assessment (website: www.darp.noaa.gov/about/index.html).

To compensate for natural resource losses resulting from discharges from its chlorine-alkali processing plant, Alcoa has agreed to undertake various restoration activities. Alcoa will transfer 729 acres of land to be preserved as part of the Aransas National Wildlife Refuge, create 70 acres of inter-tidal salt marsh within the refuge, and create 11 acres of new oyster reef habitat in Lavaca Bay. Alcoa will also construct new fishing piers at Six Mile Park, Point Comfort Park, and the Bayfront Peninsula in Point Comfort; replace an existing auxiliary boat ramp at Six Mile Park; modify an existing jetty at Magnolia Beach; and construct new timber docks at Six Mile Park and Lighthouse Beach.

Alcoa has already spent approximately $40 million conducting early response actions and will spend approximately $11.4 million to complete the remaining cleanup actions. Alcoa will also pay costs incurred by the governmental agencies in evaluating the Alcoa/Point Comfort Superfund Site and determining appropriate cleanup and restoration actions.

Under the cleanup consent decree, Alcoa will dredge mercury-contaminated sediments, operate a ground water recovery system at the former chlorine-alkali plant, cap portions of the plant and monitor sediments and fish to confirm the recovery of sediment and fish tissue to acceptable levels. In the past few years, Alcoa has paid more than $1 million for cleanup costs incurred by EPA and TCEQ. As part of the settlement, Alcoa also will pay past costs of $404,726 to the United States and $100,000 to Texas. The companies also agreed to pay the governments' future costs.

The restoration actions included in this settlement were identified through a natural resource damage assessment (NRDA) process that was undertaken cooperatively with Alcoa. That cooperative assessment process permitted comprehensive coverage of all NRDA issues associated with the site and led to good working relationships between the trustees, Alcoa, and the local community, according to the NOAA press release.

Public comment on the proposed settlements recently closed. The settlement agreements will take effect upon signature and entry by the U. S. District Court judge, after any comments received have been considered.
For info: Tom Moore (NOAA), email: Tom.Moore@noaa.gov, USDOJ website: www.usdoj.gov

WATER BRIEFS

GROUNDWATER STUDY CA

STUDY RELEASED

A comprehensive evaluation of groundwater basins in California has been finalized and is available to the public. California 's Groundwater - Bulletin 118, Update 2003 can be viewed and downloaded from the California Department of Water Resource's website. The public may provide comments and detailed information relevant to the basins and subbasins contained in the supplemental report, which will be updated as new information is available.

For info: CDWR website: www.groundwater.water.ca.gov/bulletin118/update2003/index.cfm

COLUMBIA MAINSTEM WA

NEW PROGRAM PROPOSED

Gov. Gary Locke has put forward a plan designed to institute a new water resources management program for the Columbia River mainstem. The proposal establishes a framework for issuing new water rights from the Columbia River, while simultaneously improving stream flows for fish populations. Gov. Locke's plan includes: 1) An executive-request bill for lawmakers to consider during the 2005 legislative session; 2) Capital and operating budget requests of $79 million over the next 10 years to secure water and to conduct feasibility evaluation of new off-channel storage projects; 3) Cooperative agreements with federal and local partners to obtain water; and 4) Draft rule language to implement the program. The Department of Ecology will not adopt the proposed rule prior to receiving direction from the next governor and the legislature.

For info: Bari Schneiner, Ecology, 360/ 407-6998, website: www.ecy.wa.gov/programs/wr/cri/crihome.html

PESTICIDE ASSESSMENTS WEST

EPA / ESA

EPA has completed endangered species assessments on seven remaining pesticide active ingredients named in the *Washington Toxics Coalition v. EPA* case, thereby meeting EPA's court-ordered deadline. These assessments focused on the potential risk of carbofuran, triclopyr BEE, pendimethalin, malathion, 2,4-D, lindane and bromoxynil to listed salmonid species in the Pacific Northwest and California. Where EPA determined that a pesticide's use may have an effect on any of the 26 sub-species of endangered or threatened salmon or steelhead, EPA requested consultation with the National Marine Fisheries Service (NMFS).

Consultation requests were submitted to NMFS for all of the pesticide active ingredients, with the exception of pendimethalin. Since EPA determined pendimethalin would have no effect on the 26 listed Pacific salmon and steelhead, there is no obligation on the part of EPA to consult with NMFS under the Endangered Species Act. EPA has now completed endangered species assessments for all 54 pesticide active ingredients named in WTC v. EPA.

For info:
EPA website: www.epa.gov/espp

CALENDAR

January 19 TX
Texas Water Development Board Meeting, Austin, 1-111 William B. Travis Building, 1:30pm. For info: TWDB, 512/ 463-7847, website: www.twdb.state.tx.us/

January 20-21 WA
Endangered Species Act 12th Annual Conference, Seattle, Red Lion on 5th. RE: ESA and Salmon in Washington, DC Politics, Litigation Update, Regulation of Treaty Rights Under ESA, Species and Protection, Evolution of Jeopardy, EPA and Section 7, Critical Habitat, Biodiversity, Innovative Forms of HCPs, ESA Salmon Recovery. For info: The Seminar Group, 800/574-4852, website: www.theseminargroup.net

January 20-21 WA
Buying & Selling Electric Power in the West, Seattle, Renaissance Seattle Hotel. For info: LSI, 206/ 567-4490, website: www.lawseminars.com

January 20-21 MT
Harvesting Clean Energy 5, Great Falls. Bringing Together Agriculture & Energy. For info: website: www.harvestcleanenergy.org/hce.html

January 22 CA
California EPA – State Water Resources Control Board Meeting, Sacramento, Cal/EPA Building, 1001 I Street, 10am. RE: Water Quality Petition: Discharges from Irrigation, Timber Harvest Practices in Lahontan Region and Central Valley & More. For info: Debbie Irvin, Clerk to the Board, 916/ 341-5600; email: dirvin@waterboards.ca.gov; website: www.swrcb.ca.gov/wksmtgs/schedule.html

January 23-26 FL
Source Water Protection Symposium, Palm Beach Gardens, Marriott Hotel. Sponsored by the American Water Works Association, RE: Preserving Water Quality Through Sciences and Partnerships. For info: AWWA Customer Service Group, 800/ 926-7337; website: www.awwa.org

January 25 ID
2005 Environmental Law Update, Boise, Hoff Building (Crystal Ballroom), 802 W. Bannock, 10am-1:30pm. Sponsored by the Idaho State Bar Environment & Natural Resource Section, RE: Hell's Canyon Relicensing, Sustainable Operations and Product Stewardship, Idaho Environmental Forum's 2005 Environmental Forecast. For info: ISB website: www.state.id.us/isb

January 25-26 CO
Colorado Water Conservation Board Meeting, Denver, Location TBA. For info: email:cwcbnews@state.co.us, website: http://cwcb.state.co.us/

January 25-28 TX
2005 Texas Groundwater Assn. Convention & Trade Show, Lubbock, Lubbock Memorial Civic Center. Sponsor: Texas Groundwater Assn. For info: TGA, 512/ 472-7437, website: www.tgwa.org

January 26 NE
Nebraska Natural Resources Commission, Lincoln. For info: NNRC, 402/ 471-2363, website: www.dnr.state.ne.us/commenbers/commenb2.html

January 26 WA
SEPA/NEPA Workshop, Seattle, Renaissance Seattle Hotel. RE: Compliance with SEPA/NEPA; Exemptions ; Mitigated FONSIs and DNSs; Regulatory Reform; Area Wide Planning; Project and Non-Project EISs; More. For info: LSI, 206/ 567-4490

CALENDAR

January 26-27 WA
"Creating a Future for Both People and Salmon" Shared Strategy Summit, Tacoma, Tacoma Convention Center. RE: Regional/ Local Watershed Recovery Goals, Implementation Commitments, Proposals, Projects & Incentives. For info: Jagoda Perich-Anderson, Shared Strategy for Puget Sound, 206/ 447-8667, website: www.sharedsalmonstrategy.org/ summit

January 27 WA
Stormwater: Turning a Potential Problem into an Asset, Seattle.. For Builders, Developers, Contractors, Landscapers, Architects, Engineers & Planners. For info: website: www.resourceventure.org/rv/news/ calendar/index.php

January 27-28 CA
California Wetlands 11th Annual Conference, San Diego, Loews Coronado Hotel. RE: 404 Permitting and ESA Issues, Special Area Management Plans, Mitigation Banking, National Wetlands Mitigation Action Plan, Stormwater Regs and Treatment Options, Delineation Issues, California Rapid Assessment Method. For info: CLE Int'l, 800/ 873-7130, website: www.cle.com

January 27-28 OR
Inspection Erosion Prevention / Sediment Control Workshop, Portland, City of Portland Water Pollution Control Laboratory, 6543 N Burlington. RE: Upcoming DEQ Erosion Prevention and Control Manual; Inspector's Guidance Handbook; Common Violations; BMPs; Design and Installation Standards; More. For info: Kevin Masterson, DEQ/WQ, 503/ 229-5615 or email: masterson.kevin@deq.state.or.us

January 27-28 TX
Texas Wetlands 15th Annual Conference, Houston, Omni Hotel. RE: Trip Wires to Wetlands Permitting, Riparian Protection/ Restoration, Isolated v. Adjacent Waters, Delineation and Technology, Mitigation Banks, Case Studies, Developer's Perspective, Economic Advantages in Environmental Consideration, Hot Topics, Post SWANCC. For info: CLE Int'l, 800/ 873-7130, website: www.cle.com

January 27-28 TX
5th Annual Water Law Seminar (TWCA/TRWA), Austin, Hilton. For info: TWCA, website: www.twca.org

January 27-28 NM
Law of the Rio Grande SuperConference: Albuquerque, Hyatt Regency. RE: River of Complexity: Environmental, Legal, Social & Econ Issues (Kathleen Hartnett White, Chairman, TCEQ), Developing Law of the Rio Grande, New Mexico & Texas Adjudications, Rio Grande Compact, Water Management Strategies, Bilateral Water Issues, Legislative Update, Native American Settlements & Adjudications. For info: CLE Int'l, 800/ 873-7130, website: www.cle.com

January 28 MT
Coalbed Methane Seminar, Billings and Satellite Sites. Sponsored by CLE Institute of the State Bar of Montana. For info: CLE Institute, 406/ 447-2206

February 1 WY
Wyoming State Water Forum Meeting, Cheyenne, State Engineer's Conference Room, Herschler Building 4E, 10am, Invited Guest: Tom Annear (Wyoming Game and Fish), Discussion Item: Behavioral and Physiological Effects of Winter Habitat on Trout. For info: State Engineer's Office, website: http://seo.state.wy.us/forum.aspx

February 1 CA
Project Planning: Integration of Environmental Permits, Sacramento, Presented by U.C. Davis Extension. For info: UCDavis, 800/ 752-0881, website: www.extension.ucdavis.edu

February 1-3 NV
"Growth, Water and the Quality of Life in Nevada," Nevada Water Resources Association Annual Conference, Reno. Peppermill Hotel & Casino, RE: For info: NWRA, 775/ 626-6389

February 3 WA
Modeling Contaminant Leaching Potential Under MTCA with the 3- and 4-Phase Partitioning Models, Richland, Protrain Computer Lab, 2345 Stevens Drive, 8:30am to 5pm. Presented by The Northwest Environmental Training Center. For info: Erick McWayne, NWETC, 206/ 762-1976 or emcwayne@nwetc.org, website: www.nwetc.org

February 3-4 OR
Oregon Environmental Quality Commission Meeting, Portland, DEQ Rm 3A, 811 SW 6th Ave. For info: Mikell O'Mealy, Office of DEQ Director, 503/ 229-5301, website: www.deq.state.or.us/

February 3-4 CO
NEPA: Turning Complexities Into Strategies, Broomfield, Omni Interlocken Resort. RE: NEPA Overview and Compliance, Process and Streamlining, Initiatives and Modernization, Clean Water Act, Health Impact, Platte River Cooperative Agreement, Cumulative Impacts, Content Analysis, Environmental Justice and NEPA, Categorical Exclusions and EAs, Tier 1 Programmatic Process, Regional Energy Development, Ethics. For info: CLE Int'l, 800 873-7130, website: www.cle.com

February 6-9 AZ
Water Disinfection 2005, Phoenix, Marriott Mesa. Sponsored by the Water Environment Federation (WEF). Held in cooperation with the Arizona Water Pollution Control Association (AWPCA), American Water Works Association (AWWA), and the International Water Association (IWA). For info: WEF website: www.wef.org or 800-666-0206

February 8 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

February 9 TX
Nuts & Bolts of Texas Water Rights, San Antonio, Hyatt Hill Country Resort & Spa. For info: Texas Bar, 800/ 204-2222 x1574, website: www.TexasBarCLE.com

February 10-11 OR
Oregon Fish & Wildlife Commission, Troutdale, 8 am. RE: Oregon Wolf Conservation and Management Plan, 2005 Columbia River Sturgeon and Spring Chinook Fisheries. For info: Cristy Mosset, ODFW, 503/ 947-6044, www.dfw.state.or.us/Comm/ schedule.htm

February 10-11 TX
The Changing Face of Water Rights in Texas (6th Annual), San Antonio, Hyatt Hill Country Resort & Spa. For info: Texas Bar, 800/ 204-2222 x1574, website: www.TexasBarCLE.com

February 10-11 TN
Dam Removal: Lessons Learned, Knoxville, University of Tennessee. Sponsored by The Environmental & Water Resources Institute of ASCE. RE: Various Aspects of Dam Removal, Communication Across Disciplinary Boundaries, Permitting, Economic Impacts, Biological Impacts, Social/Cultural Impacts, Aesthetics/Recreation, and Geomorphologic/Hydrologic Impacts. For info: Katie Gorscak, 703/ 295-6371, or website: www.ewrinstitute.org/ damremoval04/tennessee/ tn_register.cfm

February 14-15 AZ
Second National Water Resources Policy Dialogue, Tucson, Loews Ventana Canyon Resort. Sponsored by American Water Resources Association and Federal Agencies. RE: Water Resources Supply and Demand, Infrastructure Management, Environmental Quality. For info: Richard Engberg, AWRA, 540/ 687-8390, email: dick@awra.org, website: www.awra.org

February 15 TX
Texas Water Development Board Meeting, Austin, 1-111 William B. Travis Building, 1:30pm. For info: TWDB, 512/ 463-7847, website: www.twdb.state.tx.us/

February 15-17 DC
ACWA DC Conference, Washington, DC. RE: Annual Conference, Contact with Decision Makers Impacting Federal Water and Environmental Policy. For info: ACWA website: www.acwanet.com

February 16 WA
Natural Resource Damages Litigation Seminar, Seattle, Renaissance Seattle Hotel, 515 Madison Street. For info: Law Seminars International, 800/854-8008, website: www.lawseminars.com

February 16-17 TN
Source Water Protection: Planning for the Future, Nashville, Metro Water Services, 1700 3rd Avenue North. Sponsored by the American Water Works Association. RE: Source Water Protection Plans (SWPP), Government Roles, Delineation of Source Water Protection Areas, Contamination, Determining Susceptibility, SWP Area Management,Emergency Plans, Source Water Assessmentm, Funding Options. For info: AWWA Customer Service Group, 800/ 926-7337; website: www.awwa.org

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February 16-18 DC
Environmental Law, Washington, DC. Hyatt Regency Bethesda, RE: Clean Water Act, CERCLA, RCRA, Congressional Developments, Ethical Issues, Wetlands Developments, State and Federal Enforcement, Citizen Suits, Science and Law of Risk Evaluation, Public Lands and ESA, Sponsored by the Environmental Law Institute and The Smithsonian Institution. For info: ALI-ABA, 800/ CLE NEWS, website: www.ali-aba.org

February 18 CA
Hydro Project Relicensing: Technical and Regulatory Overview, Davis, Presented by U.C. Davis Extension. For info: UCDavis, 800/ 752-0881, website: www.extension.ucdavis.edu

February 19 CA
California EPA – State Water Resources Control Board Meeting, Sacramento, Cal/EPA Building, 1001 I Street, 9am, RE: Water Quality Control Plan for LA Region – Water Quality Objective for Chloride in the Lower Santa Clara River, Water Quality Control Plan for Sacramento and San Joaquin River Basins – Temperature Objectives & More. For info: Debbie Irvin, Clerk to the Board, 916/ 341-5600; email: dirvin@waterboards.ca.gov; website: www.swrcb.ca.gov/wksmtgs/schedule.html

February 24-25 KS
Dam Safety Conference 2005, Topeka, Holiday Inn Holidome, I-70 Exit 357A. RE: Small Dams, Proposed Regulatory Changes, Operating and Maintaining, Liability and Inspection, Sponsored by Kansas Department of Agriculture Dam Safety Program. For info: Beth Cooper, KDA, (785) 296-0573, email: bcooper@kda.state.ks.us

February 24-26 NM
10th Xeriscape Conference, Albuquerque, Albuquerque Convention Center, For info: Xeriscape Council website: www.xeriscapenm.com

February 28 CA
NEPA: Definitive and Practical Guide, Los Angeles, Century Plaza Hotel & Spa, 2025 Avenue of the Stars, RE: Cumulative Impacts, Environmental Streamlining, Defining the Scope of NEPA Analysis for Private Activities, Mitigating EAs and FONSIs, Induced Growth, CEQA/ NEPA Intersection, How to Win the Lawsuit, Purpose and Need. For info: CLE Int'l, 800 873-7130, website: www.cle.com

February 28-March 2 OR
"Generation for Generations" Northwest Hydroelectric Association Annual Conference, Portland, Lloyd Center Doubletree. RE: Columbia River Bi-Op (Hydropower's Role), Inside the Beltway, Politics of Power, Settlement Process, Regional Water Quality Process, FERC's Role (Tribal Issues, Dam Assessment Process, Defining Boundaries, Integrated Licensing Process, Resolving Conflict in License Development, Future Energy Portfolio, Pre-conference Tour of PGE's Clackamas River Project on 2/28. For info: Jan Lee (NWHA), 503/ 363-0121, website: www.nwhydro.org/downloads/NWHA05%20brochure.pdf

March 1 WY
Wyoming State Water Forum Meeting, Cheyenne, State Engineer's Conference Room, Herschler Building 4E, 10am. Invited Guest: Roundtable – All Water Forum Members, Discussion Item: Water Planning. For info: State Engineer's Office, website: http://seo.state.wy.us/forum.aspx

March 1-4 TX
Texas Water Conservation Association Annual Convention, Austin, Marriott at the Capitol. For info: TWCA, website: www.twca.org

March 3-6 OR
Public Interest Environmental Law Conference (23rd Annual): "Living As If Nature Mattered," Eugene, William Knight Law Center, University of Oregon. For info: PIELC website: www.pielc.org.

March 6-9 AZ
Membrane Technology Conference & Exposition, Phoenix. RE: Regulatory/Operational Issues, Membrane Cost Modeling, Technology Advances, Sponsored by American Water Works Association, International Water Association and European Desalination Society. For info: AWWA website: www.awwa.org/conferences/membrane/

March 6-11 CA
Pacific Fisheries Management Council Meeting, Sacramento, Doubletree Hotel, 2001 Point West Way. For info: PFMC, 866/ 806-2280, website: www.pcouncil.org/

March 7-8 CO
Colorado Water Law: Long-Term Solutions for Acquiring, Using and Protecting Water, 4th Annual Conference, Denver, Marriott City Center Hotel. RE: Well Augmentation Plans, Computer Water Accounting, Denver Water Board View, Integrating Municipal and Agricultural Water Supplies, Statewide Water Supply Initiative, Drought & Colorado River, Compliance Under ESA Sections 7 & 9, Platte River Recovery Implementation, Bypass Flows, Recreation In-Channel Diversion, Ethics, San Luis Valley, Clean Water Act Issues for Water Management, Legislative & Case Law Update. For info: CLE Int'l, 800/ 873-7130, website: www.cle.com

The Water Report
Water Rights, Water Quality & Water Solutions in the West
260 N. Polk Street • Eugene, OR 97402