**From:**
**Sent:** Friday, November 28, 2003 12:41 PM
**To:**
**Subject:** Environmental Water Use "Efficiency"

In response to the thread of correspondence on the above subject recently, I have polled the enviro caucus for their comments and have pulled together the attached response.

Nick Di Croce

Environmental Water Use Efficiency Points
November 28, 2003

Members of the Environmental Caucus have reviewed the information provided by Jay Lund, BJ Miller, Anisa Divine, and John Mills and we have synthesized our comments below.

We certainly agree that policy makers and the public should demand success and overall effectiveness where water is applied for specific environmental purposes, such as the recovery of habitat or fish. We believe that demonstrating the success or effectiveness of water applied for environmental purposes is a necessary step in evaluating any restoration program. We also concur that the State Water Plan should encourage the effective use of water applied for environmental purposes and that the water usage should show demonstrable benefits.

While water use "efficiency" measures are proper – and required – for agricultural and urban water use where water is used consumptively and is used to support a production process (farming), it makes no sense to try to apply the same kind of water use "efficiency" measures for the environment that are used for these consumptive purposes. It may make a nice catch phrase to say that "we need to level the playing field (in water use efficiency)," and that the "environmental uses (should) parallel the approach used by the urbans and agros," but it is neither an appropriate leveler nor an appropriate measure. The reasons are multiple and center mainly on the difference in the type of factors that are being measured.

- Agricultural water use efficiency clearly is measured by the amount of water applied or consumed by a unit of crop.
- Urban water usage efficiency is easily measured by the amount of water used per capita.
- Environmental water use "efficiency" cannot be directly measured by the amount of habitat recovered, by the amount of endangered fish present, or by the improvement of water quality since improvements in any one of these areas does not necessarily equate to successful ecosystem restoration.

The current approach of most restoration projects where environmental water flows are involved relies on Adaptive Management to adjust flow regimes and couple flows with other measures to achieve environmental objectives. This approach recognizes that environmental "water use efficiency" cannot be easily or directly measured, that environmental recovery is complex and non-linear, and that more macro indicators must be applied to measure success rather than the "efficiency" of individual factors. The current approach, which allows managers and decision makers to estimate and allocate the cost of a recovery project, along with measurable goals for success, and with an adaptive management approach guiding the accomplishments, appears reasonable for environmental uses of water. It also assures that environmental recovery projects come under the scrutiny of policy makers through the dollars invested and that the environmental choices are not excused from fiscal responsibility.

The complexities and the possibilities for measuring the effectiveness of environmental restoration and improved stream flows is discussed in the Nature Conservancy's paper: *Ecologically Sustainable Water Management: Managing River Flows For Ecological Integrity,* which is attached. The study emphasizes the importance of grounding recommended actions and assertions of results in good information and science. Additionally, information published by Peter Moyle and Bill Bennett raises significant questions about how much we currently know about the relationships of fish populations and instream flows.

Therefore, we feel that it is not appropriate to introduce this as a water management strategy since so little can be said about it that would be supported by science or research. We are willing to work along the lines of Jay Lund's draft, so long as we steer clear of the quantification of fish per dollar or other questionable performance measures. We believe that an "Environmental Water Use *Effectiveness*" strategy could be developed so long as the "precautionary principle" is also applied. An "*Effectiveness*" strategy, along the lines discussed above, would recognize the macro orientation that is necessary for this subject. We do not know enough about the interrelated processes of the environment to be able to define this systemically and at the micro level, which Jay Lund and group have proposed.

We also know that it is far more cost "efficient" to maintain natural systems than to have to restore them. The best way to make water available to restore degraded aquatic ecosystems is to focus on water use efficiency in human-made environments. Attempting to initiate environmental water use "efficiency" distracts from the real debate about water use efficiency and diverts energy from increasing urban and agricultural efficiency, which is our real challenge for the future.

Perhaps it would be more appropriate to investigate an Environmental Water Use Effectiveness subject in Phase 2 or 3 of the State Water Plan, once the necessary research has been coordinated with the Fish and Game Department.