Bio Credit Unit Concept
I think this could really work. But I would feel better if we could run it by some good economists for their review. DF.

OBJECTIVES

- Retain existing regulatory baseline.
- Convert debate from fights over "water" to discussions over maximizing benefits.
- Assure that water supply and ecosystem benefits improve together above this baseline.
- Generate enough benefits to attract the support of both environmental and water user interests.

CONTEXT

- Regulatory and legislative baselines (SWRCB stds, Trinity decision, CVPIA b(2) water) combined with infrastructure and existing patterns of use determine benefit patterns for the environment and water users.
- Therefore, we may improve benefit patterns simultaneously for the environment and water users by:
  - Changing the regulatory baseline
  - Adding flexibility to an established regulatory baseline. We define flexibility as authorization to generate the protections provided by a nominal standard through alternative mechanisms. Thus, for example, the EWA may be allowed to export water above the E/I ratio on the grounds that the additional exports are directly linked to equal or greater levels of protection at other periods.
  - Constructing additional infrastructure to increase our ability to convert water into benefits.
  - Changing use patterns to improve benefits. This could involve either greater efficiency of use at a given use site (efficiency) or a spacial shift in water delivery patterns (water transfers).

- Low controversy relaxations in prescriptive requirements (the COE requirements at Banks) + the additional of flexibility in regulatory standards (routine use of the E/I relaxations) + all feasible infrastructure improvements + EWA at $40 million/ year is in the ballpark for acceptable environmental benefits, but fails to meet water user demands for new benefits. Given that DNCT simulations assumed that water users controlled most new infrastructure, but still failed to meet water user delivery targets, it is clear that, even should the redefined b(2) water become more beneficial to the environment than previously thought, we will fail to meet water user targets with approaches taken today.

- Tightening regulatory/ legislative baselines enough to provide strong fish protections significantly reduces water supplies and is not a realistic outcome of CALFED.

- Relaxing regulatory/ legislative baselines enough to satisfy water users is a non starter for many and is not a realistic outcome of CALFED.

SOLUTIONS

- Therefore, the most likely remaining avenues open to CALFED involve:
  - Regulatory Flexibility
  - Changing water user patterns

- CALFED has budgeted $1 billion to invest in water efficiency. This money might generate on the order of 150 kaf of savings per year. This savings is approximately the equivalent of a like amount of new water development.
- CALFED could similarly invest in a large-scale water purchase program to buy down demand. Such a program would effectively substitute one benefit (money) for another (water) and allow limited supplies to better satisfy the remaining water users.
- Even with these programs, CALFED's ability to meet the demands of the environmental and water user interests remains highly questionable.

- The remaining option is to allow flexibility in the application of regulations beyond what we have discussed to date. This brings us to the concept of BioCredit Units.

BIO CREDIT UNITS (BCU)

Environmental regulations are put in place to generate certain biological benefits (or to avoid certain biological damage). The benefit (or avoidance of harm) is the goal. The regulation is merely a means to an end. In theory, then, if an alternative mechanism can be found which meets the environmental goal at a lower water or economic cost, we could simultaneously generate environmental and water user benefits.

This type of substitution is quite common in the regulatory arena. For example:

- The EWA will be granted the right to pump above the E/I limitations, under the assumption that EWA operations, as a whole, will provide greater levels of environmental protection than the nominal E/I ratio.
- The SWP pays a certain amount into the striped bass fund, based upon how many striped bass are entrained at the pumps
- In pollution credit programs, polluters are allow flexibility in the means by which pollution targets are met.
- Mitigation banks allow developers to inflict damage in one area, provided that they provide ample mitigation in another.

In the case of water operations, SWRCB and other standards effectively grant the water projects the right to inflict a certain amount of environmental damage upon the fish and the ecosystem (and no more). The BCU approach would allow the Projects (or the EWA) to operate below the nominal flow and export standards on the condition that the

flexibility is associated with well defined environmental improvements that significantly exceed the damage caused by the application of flexibility.

That is, the Project (or EWA) must purchase a certain number of BCUs in order to divert water beyond what would be allowed by the standards.

BCUs could be generated by:

- Reductions in pumping below standards during some other period.
- Investments in habitat improvement.
- Reductions in take through improved screening.
- Purchase of salmon fishing permits
- Improved instream flows.

BCUs would be expended upon:

- Increased take of fish caused by diversions above the E/I ratio. The greater the percentage of various fish populations taken by the additional diversions, the more BCUs expended. The cost (in BCUs) might also account for negative QWEST and the movement of X2 toward the pumps.
- Reductions in Delta outflow below the existing X2 standards.

Both the Projects and the EWA would generate and expend BCUs during their normal operations. The EWA would, naturally, tend to generate a surplus of BCUs. The Projects would tend to run a deficit unless they went out and purchased BCUs. The Projects would be allowed to purchase BCUs from the EWA, from private mitigation banks, or to develop their own BCU projects.

One difficulty is in developing conversion factors. How much habitat must be created to compensate for an increase in E/I from 35% to 38% during a period of low populations, etc. The easiest solution would be to not worry about complete accuracy, but to set very conservative conversion rates. That is, require BCU payments that significantly overstate the mitigation required. If an action takes 10 winter run salmon adult equivalents, then require a BCU payment convertible to 100 winter run salmon equivalents.

Another problem is comparability. What happens if the projects have an impact on splittail but pays up with a BCU benefiting salmon? This might be a major problem except for the existence of the ERP and EWA. If the Projects choose to purchase BCUs of a particular type, the ERP and EWA can simply reprioritize their resources to assure adequate coverage of neglected areas.

Another problem would be sharing of Project capacity. During particularly low impact periods, both the EWA and the Projects would seek to flex the E/I standards. In the case of the EWA, the water would probably be used to reduce exports at some other time. In the case of the Projects, the intent would be to boost overall exports. The answer is probably that the opportunities provided by these kinds of low impact pumping windows (i.e., not requirement many BCUs a compensation) would need to be shared in some way between the Projects and the EWA. If the Projects got first dibs, then the EWA would have a more difficult generating resources needed for operations. If the EWA had first priority, then the Projects would be stuck with generating extra diversions during periods of higher impact at greater cost.

Another problem might arise if the Projects decided to divert water extra during a period when the EWA through that additional diversions would be imprudent. In this case, the EWA would have the option of providing water to the Projects out of its own system (the Projects would still be required to purchase the necessary number of BCUs, however).

A few other quick observations:

- A permanent screen at the head of Clifton Court Forebay would significantly reduce mortality at the pumps for normal operations. This reduce mortality could be converted into an annual income of BCUs. These BCUs could be converted into extra diversions. Thus, the Projects would have an incentive to finance the screens because they are now linked to supply. Similarly, private investors could fund the screens and sell the BCUs to the projects.
- This approach could be expanded to Delta Island diversion points and elsewhere. An entire industry devoted to environmental enhancement might spring up in order to generate BCUs for sale to the Projects.
- The water transfer market could also be included. Those wishing to move water through the Delta would simply be required to purchase the requisitive number of BCUs for their transfer. This would automatically fulfill the mitigation requirements. (Transfers would be required to purchase BCUs for all transfers, not merely those above baseline regulatory standards). However, cleverly constructed transfers might generate enough BCUs via improved instream flows to pay their own way or even to generate a profit.
- The EWA (like a Central Bank) could purchase and retire BCU's in order to drive up the price of BCUs. This is not a pernicious mechanism, but rather is a way to compensate for any errors in setting the conversion rates initially or to compensate for changed science later. For example, if BCUs could be purchased and converted to water at $1 per acre-foot, then the conversion rate is probably too low. The EWA could enter the BCU market and buy up enough BCUs to drive the price up to something more reasonable. In this way, the EWA could assure that an appropriate amount of money is being invested in the creation of BCUs..
- There will need to be controls on the accumulation and/or expenditure of BCUs. The Projects cannot accumulate BCUs from export reductions during over a number of years, then simply cash them all in during a drought, wiping out the fish. This implies either that BCUs are time limited (e.g., good for only one year) or that the cost of deviations from the standards must have non linear cost functions (i.e., the cost in BCUs of increased export pumping increases exponentially). Perhaps both are appropriate. In many cases, BCUs will be generated like an annuity. A one time purchase of habitat or new screens will be convertible into an annual income in BCUs (since the benefits come each year).

FURTHER STUDIES

A number of actions need to be taken to test the merits of this approach:

- Develop a number of rough conversion factors for the creation and expenditure of BCUs.
- Modelling.
- Gaming. We could simulate this in just the same way as the past EWA games. We would start with a baseline condition, then allow the EWA and Projects to create, spend, buy and sell BCUs. We could then compute the resulting environmental and water supply benefits at the end.
- This approach is becoming increasingly complex. The advice and criticism of skilled economists is becoming increasingly important.

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