

Yakima River Basin Integrated Water Resource Management Plan

Comments by
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BACKGROUND

The U.S. Bureau of Reclamation (Reclamation) and the Washington State Department of Ecology (Ecology), working in partnership with other federal and state agencies and stakeholders, have developed the comprehensive Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan). The Integrated Plan includes a list of 20 diverse projects ranging from fish passage to water markets and construction of dams and reservoirs. Extensive modeling analysis indicate that implementation of the Integrated Plan would make it possible to achieve significant progress toward the goals of enhancing fish and wildlife habitat, improving stream flows the reliability of water supplies for irrigation and other uses.

The focus at this time has shifted from developing the Integrated Plan to securing funding for construction and implementation. The estimated total cost of the projects included in Plan is \$4 billion plus \$10 million per year in operating costs (Table 3-1, page 60 of the Integrated Plan).

For more than 100 years, the presumption has been that Reclamation would not only plan, finance, construct, and operate large projects, such as the Wymer Reservoir and Bumping Lake Enlargement in the Integrated Plan, but also arrange funding so that a big share of the costs were ultimately shifted to federal taxpayers and regional electricity rate payers. However, since the 1980s, tightened federal standards for qualifying a proposed project for federal funding and a shift of national policy away from subsidizing irrigation development have made it difficult to qualify large projects for federal funding. Reclamation's last three multi-million dollar feasibility studies in Washington State failed to qualify continued development of the Columbia Basin Project and the proposed Black Rock and Wymer Reservoirs for federal funding.

As the possibility of generous federal financing has become less likely, Reclamation and advocates of these large projects are shifting to the State as a source of capital that does not have to be repaid by the beneficiaries of the projects. The legislature is now considering House Bill 1414 (and companion SB 5376) which has the stated purposes of improving the ability of the state to work with Reclamation and various Yakima Basin water users and establishing legislative intent to promote implementation of the Integrated Plan and aggressive pursuit of water supply solutions for the Yakima Basin. HB 1414 includes provision for State funding of components of the Integrated Plan with little if any provision for evaluation of the investments

by the State. While these are laudable goals, the State should proceed with great caution regarding its own commitments to such water projects.

Ecology is proposing to begin State funding of the projects included in the Integrated Plan with a \$23.6 million 2013-15 Capital Budget request for beginning work on many of the actions and projects in the Integrated Plan. Governor Inslee's Capital Budget raised the capital allocation for the Yakima Basin to \$45 million.

The total estimated cost for the projects for which 2013-15 funds are being requested is \$3.5 billion dollars. Wymer Reservoir is listed in the Capital Budget Request at \$560 million less than in the Integrated Plan, perhaps accounting for a total estimated cost that is \$500 million less than in the Plan. Contingencies in the Integrated Plan could lead to adding a Columbia River Pump Exchange at a cost of several billion. It should be noted that there are conflicting numbers regarding component costs, total costs, and estimated benefits in various reports reflecting on the Yakima River Basin integrated plan. Quoting different sources will sometimes provide slightly different values for the YRB plan costs and benefits.

Ecology's Capital Project Request states that "the initial Early Action funding is critical to leveraging future federal appropriations that will help to pay for the multi-billion dollar cost of the Plan." However, the Request ends with the statement that: "We have not yet determined the funding arrangement with our federal and local partners."

The "arrangement" included in HB 1414 seems to be that the State is committed to pick up the full costs of projects which are, by reason of lack of economic and financial feasibility according to federal standards, not able to qualify for federal funding. Federal appropriations for studies, planning, and small preliminary costs could be used to bring the State into the position of funding the much more costly construction stages, as has happened in the continued development of the Columbia Basin Project in the Odessa Subarea.

Capital Budget Request for the Yakima River Basin Water Supply Project combined with HB 1414 sign appears to commit the State to pay as much of the \$3.5 billion, or possibly much more, cost that the federal and local partners cannot or will not pay. Furthermore, there does not appear to be any provision for independent evaluation, from the State's point of view, of projects proposed and designed by Reclamation but set up to be funded by the State of Washington.

The Yakima River Basin Integrated Water Resource Management Plan (Four Accounts Analysis of the Integrated Plan, October 2012) shows overall present value benefits over 100 years ranging from \$6.4 billion \$8.8 billion, compared to YRB plan costs ranging from \$2.7 billion to \$4.4 billion. Importantly, improved fish numbers account for 80% to 90% of total benefits. Agricultural and municipal benefits account for about 10% to 20% of total benefits, but also

account for more than 50% of total costs. The Integrated Plan Report indicates the limitations of the analysis that produced these estimates.

“The economic assessment was not designed to provide all of the information required under the Federal Principles and Guidelines for evaluating water resource projects (U.S. Water Resources Council 1983). However, it provides some initial information on the expected economic performance of the Integrated Plan. Further assessment as required by the Principles and Guidelines is planned for the next phase of investigation, as outlined in Section 6.0.”

We discuss below some of the specific issues related to the Evaluation of Economic Effects of the Integrated Plan.

ECONOMIC REVIEW

The YRB plan involves a multitude of projects ranging from fish passage to dam construction. The primary benefits flowing from this ambitious plan would be an expected increase in salmon and steelhead in the Columbia and Yakima Rivers. The legislature is considering two major proposals in support of the Yakima River Basin Integrated Plan (YRB plan). House Bill 1414 and companion SB 5376) with purposes of improving the ability of the state to work with Reclamation and various water users and establishing legislative intent to promote implementation of the plan and aggressive pursuit of water supply solutions.

A major problem in reviewing this study is the inability to assess the benefits and costs of any single component. The Bureau has deliberately designed the study report(s) in a fashion that makes it appear that all of the project components have to be considered as a package that cannot be decomposed. The reason for following this strategy is obvious. Some of the components, such as Bumping Lake Enlargement and Wymer Reservoir would have very low benefit to cost ratios (B/C ratios) if considered individually. Neither provides significant contributions to the fish enhancement portion of the overall project and would have costs far exceeding measurable benefits. Unfortunately for the State of Washington, this bundling of numerous projects into a single plan for funding and development makes it very difficult to determine which components would be worthwhile funding and which ones should be avoided. It is presented as an all or nothing package. Investment priorities cannot be considered and managed properly, or with an objective of efficiency in allocation of State funds. The YRB plan becomes a Trojan Horse that attempts to force the State to commit to the entire plan without an ability to make any project selection in the process. This method of project bundling may be acceptable under Federal rules for project evaluation, specifically in order to get funding for project components that would otherwise be economically infeasible. However, it is our opinion that the State should not accept this approach to water resource planning and should not make financial commitments to this project that imply a long run obligation to all components. Additional detail regarding our concerns about the YRB plan is presented below.

CONSTRUCTION COSTS

Table 3-1 from the Integrated Plan (page 60) shows that total base construction and contract costs for the YRB plan would be \$3,999 million. Of this total approximately one-half would be devoted to dam construction (Wymer - \$1,638.8 million and Bumping Lake enlargement \$402 million). There is no certain path to evaluating these individual dam project components. However, the Yakima River Basin Water Storage Feasibility Study (2008) did individually evaluate Wymer dam and Black Rock dam. Neither was considered to be economically feasible. Wymer dam had a B/C ratio of 0.31, meaning that costs exceeded measured benefits by about 3 to 1. Black Rock was even worse. Nevertheless, Wymer dam is still a conspicuous component of the YRB plan. Moreover, Wymer dam was found to contribute little to fisheries in the Yakima River Basin, less than 2% of current river basin fish production. It is our expectation that Bumping Lake enlargement, if evaluated separately, would have approximately the same outcome regarding benefits and costs, and contributions to the fishery. There are other large ticket items in the list of components of the YRB plan that should be questioned and evaluated individually prior to any State capital commitments for them. These include Pipeline from Lake Keechelus to Lake Kachess (\$190 m.), Lake Kachess Inactive Storage Tunnel (\$253 m.), Enhanced Agricultural Conservation (\$400 m.), Mainstem Floodplain Restoration (\$270), plus projects such as Groundwater Infiltration (\$98 m.) and Tributary Habitat Enhancement (\$180). These are all very large expenditures for State commitment and should be evaluated and considered separately, rather than in the YRB plan which is a "Trojan Horse" to get all of them funded in the name of fish benefits.

While the procedure for project evaluation followed in this case may be acceptable to meet Federal standards for funding, the procedure should not be used for allocation of scarce State funds. Importantly, in this case there has been no feasibility analysis done in the YRB plan. Hence, at this point it does not qualify for Federal funding and there is no guarantee that it will ever do so. Any State commitments to the YRB plan or its components should be carefully considered because it is likely that the State will never see any cost sharing with the Federal Government or other partners. The State should not be committed to such projects without proper and adequate evaluation of expected benefits and costs to the State. We would strongly recommend that the State not commit capital expenditures to these or similar projects that have obvious costs exceeding potential benefits.

FISH BENEFITS

The majority of benefits claimed for the YRB plan are derived from restoring and improving anadromous fish populations in the Yakima River basin. Of course the increased numbers of salmon and steelhead must be both predicted and then valued in some manner to establish an expected State benefit from the improved fishery. First, the numbers of each type of fish must be projected for each component of the YRB plan and then aggregated. The result is that salmon and steelhead numbers are predicted to increase between 181,650 and 472,450 fish per year in the Columbia River as a result of the YRB plan. This is a yield increase ranging from 9.1% to 23.6% of annual existing numbers in the Columbia River, assumed to be a constant 2.0 million per year. Making the predictions of increased fish numbers is a precarious process that must depend upon the skill and knowledge of fish biologists. Being economists we will not question this process or the results obtained, except to note that there is a wide range between the high and low estimates. And even these boundaries are likely to have wide confidence intervals in a statistical world.

The second part of this process is to place economic values on the increased numbers of fish. This is perhaps an even more difficult and contentious process. There is no market for fish in the natural environment to provide a price per pound or price per fish returning from the ocean that would lead to an easy measure of their value. Hence, the total increase in fish numbers is divided into two categories for valuation. Some of the fish are expected to be harvested in the ocean, Columbia River and Yakima River. The number of harvested fish is predicted to range from 37,997 to 102,603, depending upon the actual number of returning fish. This includes sport, commercial, and tribal harvests. The harvested fish are valued with what are called "use values", primarily based on expenditures for fishing. This is a questionable process because it implies that a fish is worth what it costs to catch it, whereas most of the expenditure is for fishing gear, travel, food, etc. That is, if a fisherman spends \$400 per day of fishing and catches only one fish it is assumed that the fish is worth \$400 but if he caught two fish each would be worth \$200. In a sense, the fewer fish caught the more they may be worth.

The returning adult fish that escape harvest are even more difficult to value. There is no direct value measure of such fish, neither through expenditures or any other form of market. For such products economists try to establish "passive use values" for the fish. In this case this was accomplished by using a mail survey of Washington households that asked what people would be willing to pay for increased numbers of salmon and steelhead (S-S) in the Columbia River system. Based upon an assumption that returning salmon and steelhead numbers were constant at 2.0 million per year in 1998, the respondents were asked their willingness-to-pay for the next 20 years for increases in the S-S populations ranging from 0% to 50% above the base population. In summary, the willingness-to-pay (WTP) numbers used in the YRB plan evaluation ranged from \$73 (low end fish number increase) to \$113 (high end increase) per household/year for the period 2012-2031. Washington households would be expected to pay

an additional \$19 per year for the next 20 years until 2051 for additional increased fish numbers, at which time the fish population would be stabilized at its highest predicted level. These WTP values by Washington households were then multiplied by the number of households in Washington (2.66 million in 2012 and 3.23 million in 2031) to establish the value of fish restored by the YRB plan.

This procedure is subject to questions at several levels. First recall that in 1998 the economy was in good shape. Home prices were increasing, the stock market was high, and unemployment was low. It is unlikely that a similar survey of WTP for increased fish numbers in Eastern Washington would yield the same results today. Second, it is unlikely that people would be willing to make such a firm commitment to a 40 year repayment schedule on a completely voluntary basis. That is, it is an expressed WTP with no contract such as for a home purchase. Finally, the survey provided about 800 usable responses to establish WTP obligations for all the households in Washington for a 20 year period. But the YRB plan evaluation assumed that such values could be applied for a 40 year period. In summary, a small survey of Washington households that is 15 years old is being applied to a 40 year future to justify spending billions of dollars on some very questionable projects. If anyone in the legislature really believes that the WTP values for fish are true expressions of good faith for the long run commitment to the YRB plan there should be a state tax devised to actually collect this money from state households.

Other questions arise in using such information to justify the large expenditures in the YRB plan. The WTP values are based on an assumption that S-S numbers in the Columbia River are constant at 2.0 million per year. But if another source of fishery increase were to occur during or prior to the completion of the YRB plan, are the results of the WTP survey negated? That is, now the base values of fish in the Columbia is no longer stable at 2.0 million per year but increasing. For example, the state of Idaho is currently considering the construction of a hatchery in the Salmon River drainage to increase sockeye fish returning to Red Fish Lake. Secondly, if the survey is used to value increased fish numbers for one project (or one component of the YRB plan) can it ever be used again for a second project? Again, it would seem that the underlying premise of survey would now be invalid and the survey results no longer useful.

We will not try to establish a different value for increased fish yields from the YRB plan. But we do want those being influenced by the results of the plan to be aware that the claimed benefits from increased fish numbers should be viewed with some skepticism and a wide confidence interval. This process is being used to request funding for projects with a total cost of nearly \$4 billion. Moreover, and most important, most of the capital expenditures will provide little or no benefit to the fishery. It is our opinion that the WTP survey is not a strong foundation for

establishing the total fish benefits expected from the YRB plan. And, most important, it is primarily the value of the fish that are being used to justify a number of other capital projects that cannot stand on their own merits, that is, their costs far exceed their benefits to either the State or the Nation.

CONCLUSIONS AND RECOMMENDATIONS

This section will be relatively brief. We offer conclusions and recommendations that are intended to be in the best interest of the State and the efficient use of its scarce funds.

- The YRB plan is a conglomerate of a long list of water projects for the Yakima River Basin. It is designed by the USBR in a way that makes it difficult to impossible to evaluate the benefits of any component of the integrated plan. The obvious purpose is this project design is to try to get a number of economically infeasible components funded based on the expected gross benefits of the overall project. **We would strongly recommend that the State not make capital commitments to the YRB plan or any individual components until more information is available regarding specific benefits and costs of the individual components to the State.**
- The YRB Integrated Water Resource Management Plan does not include a feasibility study for financing and repayment. Hence it does not qualify for federal funding at this time, and it is unknown if any federal funding will ever be available for the overall plan. **The State should not make any commitments to this overall plan until it is known what likely cost sharing is forthcoming from federal sources.**
- A request is before the legislature for several million dollars to fund feasibility studies of the water storage projects of Wymer reservoir and Bumping Lake enlargement. Wymer was evaluated in 2008 and shown to be economically infeasible. It had a B/C ratio of about 0.31, or costs were three times expected benefits. There is no reason to spend more money on another feasibility study of this dam project. Bumping Lake enlargement has not been recently evaluated for economic feasibility, but is unlikely to provide results greatly different from those for Wymer reservoir. Before a full blown feasibility study is funded there should be a required pre-feasibility study that could be done at a small fraction of the cost of the current requested funding for the full feasibility study. This would provide an indication of whether any further study or investment is justified. **The water storage components of the YRB plan should not be funded nor their proposed feasibility studies funded. Wymer reservoir is already known to be economically infeasible based on water storage projects studied in**

2008, and Bumping Lake enlargement should have a pre-feasibility study prior to any further State commitments for feasibility studies or construction.

- The State should do its own economic feasibility studies of project components in the YRB plan prior to any capital commitments. This integrated plan is designed by Federal interests in a way that might qualify for federal funding. But the State is not obligated to make any capital commitments on the basis of such a plan. **With information from existing studies most project components in the YRB plan could be evaluated for benefits and costs from a State perspective at a relatively small expense. Such information could be used to guide state funding for these water projects. This should include both fish enhancement components and the agricultural components.**
- Agricultural benefits from water storage projects in the YRB plan are largely derived from avoiding claimed crop production losses during periods of drought. However, there is considerable evidence that most past drought damage losses have been avoided through the use of water markets in the YRB. (Yakima River Basin Study, Market-Based Reallocation of Water Resources, Technical Memorandum, USBR, March 2011). Water markets can be extremely useful in allocating water to higher value uses in times of water shortage. Such water markets can often achieve the same benefits as those claimed for new water storage projects at a near zero cost to the state. **We recommend that the State encourage expansion of water markets in the state to achieve greater productivity and value from available water resources, and to avoid unnecessary capital investment in water storage projects.**