IDAHO WATER USER RECOMMENDATIONS
ON THE
MAINSTEM PLAN

COLUMBIA RIVER BASIN
FISH AND WILDLIFE PROGRAM

SUBMITTED ON BEHALF OF

THE COMMITTEE OF NINE
AND
THE IDAHO WATER USERS ASSOCIATION

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These recommendations are submitted on behalf of the Committee of Nine and the Idaho Water Users Association (hereinafter "Idaho Water Users"). The Committee of Nine is the official advisory committee for Water District 1, the largest water district in the State of Idaho. Water District 1 is responsible for the distribution of water among appropriators within the water district from the natural flow of the Snake River and storage from U.S. Bureau of Reclamation reservoirs on the Snake River above Milner Dam. The Committee of Nine is also a designated rental pool committee that has facilitated the rental of stored water to the Bureau of Reclamation to provide water for flow augmentation since 1995. The Idaho Water Users Association was formed in 1938 and represents about 300 canal companies, irrigation districts, water districts, agri-business and professional organizations, municipal and public water suppliers, and others. These recommendations have been prepared with the assistance of the scientists, biologists, and engineers who have been retained by the Idaho water users to address Snake River ESA issues.[1]

OVERVIEW

The amendment of the Northwest Power Planning Council's Columbia River Fish and Wildlife Program ("Program") to adopt a mainstem plan is an opportunity to make substantial improvements to the 1995 Program. The upcoming revisions should reflect new scientific information as well as the physical, economic, legal, and political realities in the region. This document sets forth the Idaho Water Users' recommendations with

[1] Contributors include: Dr. James J. Anderson, School of Fisheries, University of Washington; Craig L. Sommers and David B. Shaw, ERO Resources Corporation; Dr. Richard A. Hinrichsen, Hinrichsen Environmental Services; Dr. William J. McNeil, retired professor of fisheries, Oregon State University. These individuals also contributed to comments by the Idaho water users on NMFS' draft White Paper on flow (10/29/99), the Federal Agencies' draft All-H Paper (3/16/00), the Corps' draft Feasibility Report and Environmental Impact Statement (3/31/00), and recommendations and comments on the Council's 2000 Fish and Wildlife Program.

respect to a number of components of the mainstem portion of the Program. The focus of these recommendations is on issues related to flow targets at Lower Granite Reservoir (LGR) and flow augmentation from the Upper Snake River.[2]

Idaho water users support salmon recovery. However, Idaho water users are becoming increasingly frustrated by the lack of response to legitimate scientific concerns raised in their numerous comments on documents involving salmon recovery, NEPA compliance, and ESA issues. Agencies and tribes continue to demand release of water from the Upper Snake River for flow augmentation in the name of salmon recovery, yet the purported benefit of Upper Snake flow augmentation has never been documented. The concerns of the Idaho Water Users, the same water users who provide much of the storage water to the Bureau of Reclamation for flow augmentation, are not even acknowledged in most cases.

As discussed in the recommendations below and Appendix 1, development of water resources in the Upper Snake River basin did not cause the decline of fish populations and has not resulted in the degradation of habitat. Reducing Upper Snake River water uses to provide flow augmentation will not reverse the fish population decline, recover the populations, or mitigate the adverse modification of critical habitat caused by activities in the lower Snake and Columbia Rivers. Continued calls for ever-increasing amounts of water from southern Idaho ignore the fact that there is no significant biological benefit from an action that has enormous economic and social costs.

LGR flow targets and Upper Snake River flow augmentation to meet those targets are not necessary or viable components of the Program because they fail to meet the goals and objectives established by the Council and do not reflect and balance the realities of the region. These measures do not provide significant biological or physical benefits; have high economic cost and impact; and must overcome huge political and legal hurdles.

[2]Throughout these comments, the Upper Snake River means the portion of the basin above Brownlee Reservoir.

SUMMARY OF RECOMMENDATIONS

The Idaho Water Users' principal recommendations on the mainstem plan are:

- The scope of the mainstem plan should be confined to the portions of the mainstem Snake and Columbia Rivers affected by major hydroelectric facilities. As a practical matter, that means the primary focus should be the FCRPS. Furthermore, although Upper Snake flow augmentation should be eliminated because it is a costly and ineffective measure, consideration of this issue should be deferred until plans for subbasins are developed.
- The mainstem plan must be consistent with the Northwest Power Act. The duty of the Council is to "protect, mitigate and enhance fish and wildlife" affected by the hydrosystem, "while assuring the Pacific Northwest an adequate, efficient, economical and reliable power supply." The Council has a duty and a unique opportunity to bring reason and balance to the mainstem debate. In addition to optimizing power production, the Council should develop and refine tools for evaluating the cost-effectiveness of fish and wildlife management measures.
- In the mainstem plan, juvenile passage measures should be based on actions that are the most biologically effective and cost-effective, not on a strategy to provide conditions that most closely approximate natural conditions. Research on improved transportation should be a focus of the plan.
- The Council needs to implement Scientific Principle 7 (ecological management is adaptive and experimental) by abolishing flow targets at LGR. Flow targets at LGR are inconsistent with the Program because the hydrograph is already "natural" –Snake River flow above LGR remains virtually unchanged from the conditions that salmon have adapted to over thousands of years. The Council should ask the ISAB to reevaluate its Review of Lower Snake Flow Augmentation Studies.
- To the extent that the Council expands the scope of its mainstem plan to areas upstream of LGR, the legal constraints and negative effects on power supply should be a basis for rejection of the use of powerhead space in USBR irrigation storage projects to supplement Upper Snake flow augmentation in dry years.
- One of the Council's high priority long-term objectives should be development of additional off-stream storage facilities, especially if the Council persists in pursuit of Upper Snake flow augmentation as off-site mitigation for hydroelectric impacts.

Our prior recommendations and comments on the Council's 2000 Program contain additional ideas and concerns relevant to the mainstem plan and are incorporated by this reference as though set forth in full herein (IWU 2000a and 2000b).

SCOPE OF THE MAINSTEM PLAN

Recommendations: The scope of the mainstem plan should be confined to the portions of the mainstem Snake and Columbia Rivers affected by major hydroelectric facilities. As a practical matter, that means the primary focus should be the FCRPS. Furthermore, although Upper Snake flow augmentation should be eliminated because it is a costly and ineffective measure, consideration of this issue should be deferred until plans for subbasins are developed.

Discussion: The 2000 Fish and Wildlife Program is ambiguous as to the geographic scope of the mainstem plan. The glossary for the Program defines "mainstem" as:

> "*The main channel of the river in a river basin, as opposed to the streams and smaller rivers that feed into it. In the fish and wildlife program, mainstem refers to the entirety of the Columbia and Snake rivers*" (NPPC 2000c, pp. A-2, 3).

As discussed below, the Idaho Water Users believe that this definition of mainstem is far too broad. Instead, "mainstem" effectively should be synonymous with the FCRPS.

The Northwest Power Act directs the Council to develop a Program that consists of "measures to protect, mitigate, and enhance fish and wildlife <u>affected by the development, operation and management of such [hydroelectric] facilities</u>" (16 USC §839b(h)(5), emphasis added). In a finding on one of the Idaho Water User's recommendations for the overall Program, the Council recognized the difference between the mainstem hydrosystem and upstream areas:

> *"The Water Users are obviously concerned that the program not extend its jurisdiction to require mitigation for the fish and wildlife impacts of irrigation activities in the upper Snake or to require changes in irrigation operations to address the fish and wildlife effects of the hydrosystem. The Council has always been clear about the extent of the program's scope in this regard: To the extent the program identifies changes in water management that are needed in the Snake River to improve the survival and production of fish and wildlife affected by the hydrosystem (an issue of continuing controversy), then the federal agencies operating or regulating federal or non-federal <u>hydroelectric facilities</u> in the Snake River do have an obligation to take those recommended changes into account in deciding how to operate or regulate those projects. <u>Federal, state, and private entities operating or regulating irrigation projects do</u>*

> *not have the same obligation; any changes in those operations to benefit fish and wildlife under the program can come only through a willing seller/willing buyer basis or some other voluntary contractual arrangement allowed by the state, as part of off-site mitigation allowed under the program* (NPPC 2001, pp. 57, 58; emphasis added).

Thus, the mainstem on the Snake River would extend upstream to Brownlee Reservoir at most but no further. Although Idaho Power has some small run-of-the river hydroelectric dams upstream from Brownlee, those facilities have had minimal, if any, effect on fish and wildlife in the lower Snake and Columbia Rivers. In any event, there is no basis for the mainstem plan in the Program to extend along the Upper Snake through irrigation storage reservoirs such as American Falls, Palisades, and Jackson.

In addition, it is clear that the regional debate over the allocation and use of resources with respect to the mainstem of the Snake and Columbia Rivers has centered and will continue to focus on the recovery of listed species in the context of operation of the FCRPS. As the Council considers a mainstem plan for the Program, it should concentrate on the interaction of the listed species and FCRPS facilities. In adopting a mainstem plan, the Council should not be distracted by the many opposing arguments concerning the use and allocation of resources in other geographic areas. The Council has set up a process whereby other parts of the watershed will be subject to later subbasin planning efforts. Under the Council's new Program, off-site mitigation within areas tributary to the mainstem (such as habitat in, or flow augmentation from, upstream portions of the basin) should be considered within the context of a particular subbasin. During development of the mainstem plan, the Council should consider the extent to which the FCRPS hydroelectric dams have altered the flow regime in the lower Snake and Columbia Rivers, the effect of those dams on the listed species, and what might be done to enhance the listed species by measures **within the mainstem**. In other words, protection, mitigation and enhancement measures in the mainstem plan with respect to anadromous fish should address alternatives involving operation of the FCRPS, not flow augmentation from storage facilities above the hydrosystem.

The 1994/95 Program contained an off-site mainstem enhancement measure in the form of flow augmentation from the Upper Snake River. Although Idaho Water Users

continue to maintain that the Council should recognize Upper Snake River flow augmentation for what it is — an unsuccessful experiment that attempted to mitigate passage problems created by the FCRPS — under the new Program, that issue is not ripe for consideration at this time. (For an extensive discussion of the futility and expense of Upper Snake flow augmentation, see Appendix 1.) Consideration of Upper Snake flow augmentation, if any, should be deferred from the mainstem plan and considered as part of the subbasin plans from which water would be sought, e.g., the Snake River from Hells Canyon Dam to Shoshone Falls, the Boise, and the Owyhee subbasins in the Middle Snake Province; and the various subbasins in the Upper Snake Province.

NEED FOR A BALANCED PLAN

Recommendations: The mainstem plan must be consistent with the Northwest Power Act. The duty of the Council is to "protect, mitigate and enhance fish and wildlife" affected by the hydrosystem, "<u>while assuring the Pacific Northwest an adequate, efficient, economical and reliable power supply</u>." The Council has a duty and a unique opportunity to bring reason and balance to the mainstem debate. In addition to optimizing power production, the Council should develop and refine tools for evaluating the cost-effectiveness of fish and wildlife management measures.

Discussion: Congress placed the Council in a special position relative to other entities involved in the overall management of resources in the Pacific Northwest. Other state, federal, tribal, and private entities have relatively narrow missions with respect to geographic areas or resources. In contrast, the Council is charged with seeking a regional balance between fish and wildlife concerns and power production. This unique role provides an opportunity for the Council to develop innovative policy by bringing sound reason and careful balance to the emotionally charged, polarized mainstem debate.

Consistent with Program's vision, Idaho Water Users believe that the mainstem is a portion of the basin "where impacts have irrevocably changed the ecosystem" (NPPC 2000c, p. 13). In other words, it is not feasible to implement the vision "by protecting and restoring the natural ecological functions, habitats, and biological diversity" of that part of the Columbia River Basin. Moreover, it is critical on the mainstem, even more

than elsewhere, that "actions taken under the Program must be cost-effective and consistent with an adequate, efficient, economical and reliable power supply." Thus, as discussed below, the mainstem plan represents an opportunity for the Council to realistically consider the feasibility and effectiveness of implementing various management measures within the FCRPS and to set courageous policy which balances ecology and economics – not just to attempt to placate the wishes of the fish and wildlife agencies or the tribes. Moreover, additional emphasis on economic considerations as part of the mainstem plan would reflect the dual charge to the Council under the Pacific Northwest Power Planning and Conservation Act of 1980 as described in the Introduction to the Program — to protect, mitigate and enhance fish and wildlife; and to assure power supplies (16 USC §839b).

In terms of flow and spill, Idaho Water Users support the power optimization strategy that the Council has adopted as part of the Program (NPPC 2000c, p. 27). In order to further implement that strategy as part of the mainstem plan, it is crucial that the cost-effectiveness of flow and spill management be considered as part of the mainstem plan. Moreover, all other strategies, policies and projects in the mainstem plan also should be subject to an evaluation of cost-effectiveness relative to other options in order to assess the incremental biological benefit for a given cost.

In response to the Idaho Water Users' recommendation that the Program incorporate cost-effectiveness, the Council found:

> "*The IEAB and the Council have identified the program framework itself, and especially the development of specific, measurable biological objectives, as the critical factor needed for the Council to be able to conduct a rigorous, quantitative cost-effectiveness analysis of projects proposed for funding. The Council and IEAB also focused on identifying reforms in the project solicitation and review procedures to enhance the likelihood that projects selected will be the most cost effective. Various amendments just adopted to the program reflect these principles. The Council remains open to the possibility of adopting cost-effectiveness principles into the program in the future, if it receives appropriate, specific, functional recommendations that offer more guidance than a reiteration of the cost-effectiveness principle*" (NPPC 2001, p. 56, 57).

The Idaho Water Users submit that cost-effectiveness analysis must go beyond the evaluation of specific projects and also be used in the evaluation of potential Program measures. As to "appropriate, specific, functional recommendations," we suggest the following steps:

- Establish a baseline of current conditions that represents the physical system and the populations of listed species, but does NOT include the management measures being considered by the Council such as improved smolt transportation, spill, flow augmentation, hatchery modifications, or additional harvest restrictions.
- Use existing models (e.g., CRiSP, SIMPAS and EDT) to estimate the biological response from each potential management measure. For cost-effectiveness analyses, biological responses to potential management measures should be expressed in terms of the number of adult recruits predicted above the baseline level.[3]
- Use readily available information to estimate the economic cost of each potential management measure (net of any economic benefits).
- Rank the management measures for relative cost-effectiveness per unit of biological response. Also rank the measures against total biological response.
- Adopt only those measures that provide significant biological benefits and are most cost-effective.

Although uncertainty about the biological results of management measures creates challenges for cost-effectiveness analysis, such an analysis can provide important information for the Council. The Independent Economic Analysis Board (IEAB) raises several issues that must be addressed in cost-effectiveness analysis, but notes that such analysis may provide useful information, particularly if projects are aggregated – as would be the case when addressing broad management measures or policy issues (IEAB 1999). The Independent Scientific Advisory Board (ISAB) concludes that existing models, if used in conjunction with each other, can provide a great deal of useable information for decision-makers (ISAB 2001).

[3] This approach is a pairwise comparison of alternatives against the baseline. The recruit estimates can be derived using survival and mechanistic models to predict life-stage survivals resulting from the management measures. For an example of this approach, see Anderson et al. 2000.

JUVENILE PASSAGE MEASURES

Recommendations: In the mainstem plan, juvenile passage measures should be based on actions that are the most biologically effective and cost-effective, not on a strategy to provide conditions that most closely approximate natural conditions. Research on improved transportation should be a focus of the plan.

Discussion: Rather than attempting to provide mainstem conditions that most closely approximate or tend toward "natural" hydrographic patterns (NPPC 2000c, pp. 25-27), the amended Program should concentrate on management of human activities (e.g., harvest) that have a demonstrated benefit to listed species. Management strategies should realize the practical limits of the system, balance the needs of anadromous and resident species, and consider power supply impacts.

The mainstem strategy in the Program focuses too heavily on trying to "provide conditions in the hydrosystem for adult and juvenile fish that most closely approximate natural physical and biological conditions" (NPPC 2000c, p. 34). The goal of passage solutions should be to enhance the survival of salmonids, not to simply pursue the most "natural" approach. For example, improved transportation should be considered as a primary management option. Studies have consistently shown that the smolt-to-adult return (SAR) of transported fish is higher than the SAR of in-river migrants (e.g., NMFS 2000). Also, there may be opportunities to further improve transportation success by using towed net pens (McNeil et al., 1991). Transportation improvements should be considered, fairly and fully, as a permanent passage solution even though they may be antithetical to the "normative river" concept.[4] Moreover, transportation is much more

[4] The Program states *"The Council (1) accepts juvenile fish transportation as a transitional strategy, (2) will give priority to the funding of research that more accurately measures the effect of improved inriver migration compared to transportation; 3) will recommend increasing inriver migration when research demonstrates that salmon survival would be improved as a result of such migration; and 4) endorses the strategy of "spread the risk" which, depending on water and environmental conditions, divides migrating juvenile salmon and steelhead between inriver passage and transportation"* (NPPC 2000c, p. 27). This language infers that the Council has already adopted inriver passage as a major part of the solution, regardless of the cost or biological effectiveness.

cost-effective than the alternative approaches of spill, flow augmentation or dam removal.

While the principle of "provid[ing] conditions in the hydrosystem for adult and juvenile fish that most closely approximate natural physical and biological conditions"" sounds good, it is unrealistic given the existing hydrosystem configuration. The ecosystem created by the four lower Snake reservoirs is much different than pre-dam conditions. For example, velocity has been reduced by an order of magnitude, the reservoirs favor a different set of predators, and temperature dynamics have changed (U.S. Army Corps of Engineers et al. 1999, pp. 4.4-5, 4.4-8, 4.5-26 to 4.5-32, Appendix F).

Mainstem water management must be consistent with the goals and objectives described in the Fish and Wildlife Program. As discussed above, the goals and objectives must reflect a balance of economics and ecology in a manner consistent with the physical, legal and political realities. Balance and consistency with reality can be achieved by applying standards of cost-effectiveness and biological effectiveness to management options. For example, as discussed below and in Appendix 1, Upper Snake River flow augmentation entails high cost with little or no biological benefit and even potential biological harm. Thus, arguments for additional Upper Snake flow violate the Council's requirement for a cost-effective biological benefit even if flow augmentation were to be viewed as a measure in pursuit of more "natural" conditions.

The fact that Upper Snake River flow augmentation is costly and ineffectual is further supported in the NPPC's own Multi-Species Framework Project (Project). Even though we understand that the Program amendment process and the Project are separate processes, the request for recommendations on the overall program noted that the results of the Project "…would be useful planning guidance for the Council" (NPPC 2000a). Specifically, the Project's results show that Upper Snake River flow augmentation is not a cost-effective strategy (NPPC 2000b). These results and further cost-effectiveness analysis should be used to shape future strategies and plans involving the Blue Mountain, Middle Snake and Upper Snake ecological provinces and focus on options other than Upper Snake River flow augmentation.

ABOLISH LOWER GRANITE FLOW TARGETS

Recommendation: The Council needs to implement Scientific Principle 7 (ecological management is adaptive and experimental) by abolishing flow targets at LGR. Flow targets at LGR are inconsistent with the Program because the hydrograph is "natural" – Snake River flow above the FCRPS remains virtually unchanged from the conditions that the salmon have faced for thousands of years. The Council should ask the ISAB to reevaluate its Review of Lower Snake Flow Augmentation Studies.

Discussion: In establishing the mainstem plan, the Council needs to pay particular attention to the science involving Lower Granite flow targets, which lead to calls for Upper Snake flow augmentation. As discussed below, the science does not support these measures.

In support of the 1995 BiOp, NMFS called for "interim target flows" — and thus, flow augmentation — on the basis of a finding that "… a general relationship of increasing survival of Columbia River basin salmon and steelhead with increasing flow is reasonable" (NMFS 1995, pp. 1, 2). The Council originally suggested Upper Snake flow augmentation as an "experiment" to test the hypothesis that there is a "relationship between spring and summer flow, velocity and fish survival" in an adaptive management framework (NPPC 1994, p. 5-13). In essence, in the 1995 and 1998 BiOps and in the existing Program, the 427 kaf of Upper Snake flow augmentation was included as part of an interim, experimental mitigation package for the impact on listed species caused by FCRPS operations. Despite the lack of scientific evidence or legal basis for flow augmentation, Idaho water users acquiesced in the experimental program and helped pass state legislation to authorize the experimental use of water for flow augmentation. Several years of research were conducted to assess the effects of flow on the survival of listed species. As discussed below and in Appendices 1 and 2, no significant benefit from Upper Snake River flow augmentation is evident from the research. Indeed, this augmentation may be detrimental to the listed species. Thus, the basis for the Council's (and NMFS') interim flow augmentation no longer exists.

Dr. James Anderson has succinctly summarized biological research and findings with respect to flow augmentation in recent testimony before the House Subcommittee on Water and Power:

Flow Augmentation

"A significant question during this drought concerns the effectiveness of flow augmentation in improving fish survival. To address this question it is important to first realize that a relationship of seasonal flow and smolt survival within a year, or a relationship of flow and survival between years, does not imply flow augmentation will increase survival. Flow augmentation is produced by scheduled releases from storage reservoirs and by limiting municipal and agricultural withdrawals. Flow augmentation does not change the yearly averaged flow; it only reshapes the runoff over the season. Flow augmentation has a small and variable impact on the natural seasonal flow, temperature and turbidity, because the natural patterns are driven by the unregulated tributary runoff while flow augmentation is mostly from storage reservoirs.

Based on flow and smolt survival research, a relationship has been found between yearly-averaged flows and the survival of [spring/summer] chinook and steelhead passing through the hydrosystem. However, the same research demonstrates that seasonal flows are not correlated with hydrosystem survival. Because flow augmentation makes up a small portion of the seasonal flow, it too is not correlated with smolt hydrosystem survival.

A relationship between seasonal flow and survival of fall chinook migrating from Hells Canyon to Lower Granite Dam has been observed in studies. Here again, the contribution of flow augmentation to this seasonal flow is small and the potential impact on survival is not measurable. Furthermore, there is a reasonable possibility that flow augmentation from the Hells Canyon dam complex may in some years decrease fish survival (Anderson, Hinrichsen and Van Holmes 2000). The research indicates that the natural seasonal patterns of flow, temperature and turbidity are correlated, so simple correlations [of] any of these variables with smolt survival does not identify which one may affect survival. Based on fish bioenergetics, increased temperature will increase smolt mortality and since water releases from Hells Canyon can increase the Snake River temperature, augmentation can increase mortality. Furthermore, in these studies fish travel time was uncorrelated with flow, so it has no effect in reducing smolt exposure time to predators.

Simply put, flow survival studies conducted over 8 years indicate that the impacts of flow augmentation on smolt survival are not measurable at best, may be neutral, and in some situations may decrease survival. Potential impacts of flow augmentation on survival can be estimated with models. However, the benefits were not estimated in the NMFS Biological Opinion". (Anderson 2001)

2001 ISAB Review

Recently, the ISAB completed a Review of Lower Snake River Flow Augmentation Studies (ISAB 2001). The Idaho Water Users are greatly disappointed that the ISAB failed to fully grasp the basic issue that has contributed so much confusion to the flow augmentation debate – that flow augmentation from storage reservoirs does not result in the same environmental conditions associated with higher natural flows.[5] In other words, most published research has only looked at correlations of fish movement and survival in relation to natural variations of environmental conditions such as flow, temperature, and turbidity. Then, that research has been extrapolated to infer that man-made additions of flow will result in the same environmental attributes as higher flow under natural conditions. These extrapolations contain an untested and questionable assumption that incremental flow augmentation within a year has the same effect on survival as the year-to-year changes in flow that are also accompanied by year-to-year changes in climate and ocean conditions. At several critical points, the ISAB review falls into this same rut of drawing conclusions about flow augmentation from inappropriate extrapolations of research on natural variations (Appendix 2). For example: "Flow augmentation should continue, largely because Connor's studies show benefits for wild fish and the NMFS studies show high correlation of flow survival in a designed study" (ISAB 2001, p. 3). As discussed in Appendix 1, Connor's studies suffer from problems involving confounding effects of flow in relation to other environmental variables (photoperiod, water temperature and turbidity) and the relationship of survival to independent variables

[5] We are also disappointed that the ISAB did not carefully review all of the available information. For example, the review states that no reports have used "sophisticated techniques, such as multivariate statistical methods or multiple regression modeling" of NMFS data (ISAB 2001, p. 2). However, the review references Anderson et al 2000, which contains a substantial section on multiple regression of PIT-tag and environmental data, including an analysis of collinearity. As discussed in Appendix 1, the Anderson analysis found flow to be a poor predictor of survival while date of migration, temperature and turbidity were much more strongly correlated with survival.

As another example, the review cites figures in Connor 2000 as showing "flow, water temperature, and adjusted flow and water temperature (without flow augmentation)" when, in fact, there are no such figures in Connor's report.

other than flow such as degree of smoltification, size of juveniles, predation, and competition.

The Idaho Water Users recognize that there may be a few unique situations where flow augmentation may benefit the survival of listed species. For example, Connor et al. found benefits of summer flow augmentation for fall chinook result from cold-water releases from Dworshak Dam to the Clearwater River (Connor et al. 1998). However, these conclusions cannot be extrapolated to flow augmentation from the Upper Snake where the reservoirs release warmer, not cooler, water during the summer (Appendix 1).

The ISAB review recommends some changes in experimental design in order to achieve a better understanding of the relationship of flow to survival of listed species. The Idaho Water Users agree that the focus of any future research needs to shift from studying the survival changes associated with natural variations in environmental variables to the specific evaluation of the effects of flow augmentation. Unfortunately, the ISAB's suggestion that a reanalysis of the data in existing NMFS studies may be sufficient to evaluate flow augmentation is flawed. The ISAB lists eight combinations of environmental variables that should be evaluated; however, each of those combinations simply reflects natural conditions, not the river environment that results from flow manipulation.

The Council should ask the ISAB to reevaluate its Review of Lower Snake Flow Augmentation Studies with the above comments in mind. Ultimately, we agree with the ISAB's recommendation that a goal of the Program should be guidelines on flow augmentation. For situations like summer/fall releases of cold water from Dworshak, where there appears to be evidence of survival benefits to listed species, flow augmentation may be a cost-effective component of the Program. However, for the Upper Snake, where scientific research does not support flow augmentation and there are enormous costs associated with providing additional water, the guideline should be no flow augmentation.

Impact of Flow Augmentation

In an attempt to meet LGR flow targets, the Upper Snake River basin has supplied over 3.5 million acre-feet (MAF) of water for flow augmentation over the past 10 years. Another 15 MAF have been provided from Brownlee and Dworshak Reservoirs (Appendix 1). In spite of the enormous volume of water that has been released for flow augmentation, there is no evidence that this added water has contributed to the survival of Snake River spring and summer chinook, steelhead, or sockeye populations or will promote their recovery (Appendices 1 and 2). Studies of fall chinook survival above Lower Granite Reservoir show a relationship to migration timing, temperature, turbidity, flow, and travel time (in that order), but the relationship between flow and adult survival is not statistically or biologically significant (Appendix 1).

The existing level of flow augmentation from the Upper Snake River (427,000 AF/yr) should be discontinued since it provides no significant benefit to listed species or their habitat and impacts will occur on water users and local resources in dry years. Likewise, an aggressive program of additional flow augmentation, such as the proposals to take up to another 1 MAF out of the Upper Snake River, will bring strong opposition from Idaho water users. Such a program will have devastating impacts on southern Idaho by drying up hundreds of thousands of acres of productive farmland, costing tens of millions of dollars per year, causing thousands of lost jobs, and severely impacting local fisheries, wildlife habitat, recreation, and the cultural and historical resources of the Upper Snake River (USBR, 1999; Appendix 1).

CONSIDERATION OF UPPER SNAKE POWER IMPACTS

Recommendation: To the extent that the Council expands the scope of its mainstem plan to areas upstream of LGR, the legal constraints and negative effects on power supply should be a basis for rejection of the use of powerhead space in USBR irrigation storage projects to supplement Upper Snake flow augmentation in dry years.

Discussion: The Council's March 14, 2001 memorandum that accompanied the request for recommendations asked for suggestions on power supply considerations in

adopting the mainstem plan. As to the mainstem, elimination of the LGR flow targets is consistent with meeting the needs of fish and wildlife while assuring an adequate, efficient, economical and reliable power supply for the region. The Council's analysis of the Idaho Water User's recommendation to eliminate Upper Snake flow augmentation shows that there would be a negligible impact on hydro generation (Fazio 2000, pp. 2, 3, 14). On the other hand, powerhead space in Upper Snake irrigation storage facilities has been used to supply flow augmentation at the expense of local power generation. Thus, while the Idaho Water Users believe that the mainstem plan for the Snake River should focus on the reaches of the Snake and Columbia Rivers below LGR, if the Council decides to include off-site mitigation measures above Brownlee Reservoir, the power implications of those measures must be evaluated. In particular, the use of powerhead space in Bureau of Reclamation (Reclamation) irrigation storage reservoirs to supplement Upper Snake flow augmentation in dry years has a significant localized impact on power and water supply and is illegal.

The primary authorized purpose of Reclamation projects in the Upper Snake is to supply irrigation water. One of the additional authorized purposes of the Anderson Ranch, Minidoka and Palisades Projects is power production. In the past, contrary to this authorized purpose, NMFS has required Reclamation to use water released from powerhead space in the event that the flow augmentation amounts cannot be acquired by other means (e.g., 1998 BiOp). There are legal constraints that prohibit this use and power supply impacts if those constraints are ignored. In the Upper Snake projects that have a power component, the development of power was necessary for the irrigation of the lands under the Reclamation projects and the power generated by the Reclamation projects is reserved for use on that project. In 43 USC §522, Congress has clearly provided that surplus power and power privileges cannot be used so as to impair the efficiency of the irrigation project. The cost of power is based upon the cost of production. Powerhead space is used to provide hydraulic head for the generation of power. Without this hydraulic head, the efficiency of generating power is reduced or generating units will not operate properly and must be shut down. In turn, the increased costs for power directly affect the efficiency of the irrigation project by increasing costs.

On the other hand, if use of the powerhead space is based upon the premise that the powerhead water is "surplus," 43 USC §521 provides that Reclamation must obtain the approval of the spaceholders in the storage facility for release of that water. This section of the code further provides that such water shall not be released for other uses if the delivery of such water is detrimental to the water service of the irrigation project. When powerhead space is released, carryover storage is reduced and the potential for refill is affected.

In addition, the storage and distribution of water in each of the Upper Snake Reclamation projects is controlled by a state water right issued by the State of Idaho for such uses, as required by the Reclamation Act of 1902. Reclamation does not have discretion to use the storage and distribution facilities without regard to state law. In terms of powerhead space, the state water right for the projects does not allow for release and refill of the space. In addition, Idaho Code Section 42-1763B, which provides state law authority for Reclamation to make salmon water releases, does not include powerhead water.

ADDITIONAL STORAGE SHOULD BE A LONG-TERM GOAL

Recommendation: One of the Council's high priority long-term objectives should be development of additional off-stream storage facilities, especially if the Council persists in pursuit of Upper Snake flow augmentation as off-site mitigation for hydroelectric impacts.

Discussion: Over the past decade, additional off-stream storage projects have been periodically proposed as a means of supplementing flows in the Snake River. The top three projects in the Upper Snake that have been studied by Reclamation and the Corps are Moores Hollow, Galloway, and Upper Rosevear Gulch. These three projects have relatively minimal environmental impacts and appear to satisfy the conditions in Appendix B of the Program. Each would provide between 300,000 and 600,000 acre-feet for fish and power purposes.

The Council should incorporate the evaluation of additional storage projects into the Program. Assistance should be requested from Reclamation and Corps in providing

existing information on storage projects that have been studied and in updating that information.

CONCLUSIONS

In summary, LGR flow targets and the associated Upper Snake River flow augmentation should be eliminated from consideration as part of the Program. Idaho Water Users conceded to a trial period during which any benefit of Upper Snake River flow augmentation could be demonstrated. The trial period has ended and no fish or wildlife benefit has been demonstrated.

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