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SUMMARY OF COMMENTS AND RESPONSES WATER QUANTITY TOPIC FORUM

JULY 11, 2008

Water Quantity
Comment Summary

July 11, 2008

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Introduction

Following is a summary of comments received on the Water Quantity Topic Forum Paper. These comments were received at the Topic Forum Workshop, held on May 5 in Edmonds. More than 100 people attended the forum, providing comments on all aspects of the discussion draft. In addition, comments were obtained through email and through an online discussion tool on the Partnership's web page. More than 170 pages of comments were received on the Water Quantity discussion paper. These comments have been sorted and summarized by theme; and general responses provided below. Many comments were made numerous times, and some requested information at a level of detail that is beyond the scope of the topic forum paper or outside the Partnership's objectives. The responses provided below indicate how the comment was addressed; individual responses to each comment are not provided, but all comments were reviewed and considered. All comments received can be viewed on the Partnership web page.

Key Themes

Freshwater resources should be managed at the regional as well as local scale, through development of regional goals and objectives, with local solutions and accountability.

There is a need for accountability and transparency at all levels of water system management tiered levels of responsibility that start at the local level and carry through to the regional level.

Both urban and rural issues need to be considered in a regional freshwater resources management plan. Urban issues, as well as issues facing agricultural and other rural communities, need to be addressed.

There is inadequate information about existing water uses as well as projected water needs. Existing water system/supply management is not well understood, and there is a need for more accurate modeling of projected water needs from both an integrated ecological / human perspective

Exempt wells need to be accounted for and better managed.

Monitoring and enforcement of regulations already in place is not occurring effectively, effective implementation of existing regulations should be a top priority.

Instream flow standards need to be set, need to be presented in a broader context; recognizing urban/rural differences, clearly state end-points, with broadly defined benefits.

Regional metering is needed.

Topics Missing/Underemphasized

Comments	Response
<p>Seasonal Flow Variations and Spatial and Geographic Distribution (underemphasized)</p> <ul style="list-style-type: none"> • Paper should address timing and seasonality of flows and spatial and geographic distribution as well as quantity of flows. 	<p>The timing, seasonality and geographic distribution of flows have been further addressed in the revised Topic Forum discussion paper S1, Section A and Figure S1-A. Additional local information is a level of detail that is beyond the scope of the topic forum discussion draft. To the extent possible, this information will be noted in the action area profiles.</p>
<p>Stormwater management (underemphasized)</p> <ul style="list-style-type: none"> • Impacts of stormwater runoff on water quantity are significant and need to be addressed in this paper. • Include high flow rates of stormwater from urban impervious area, including peak flows immediately following storm events and accompanying changes to geomorphology. • The removal of water by human use is well addressed but the discussion of the replenishment and a primary source of freshwater (stormwater) is significantly missing. • Need to discuss the change in the natural hydrology over the course of the year because of the increase in impervious surface, and the channelization of stormwater to local surface water bodies, which increase flows in the winter and reduce instream flows in the summer. The year-round flow regime needs to be discussed in greater detail in this paper. • One issue that was not included in the paper is the discussion of directing stormwater to ground as a treatment BMP. This subject is addressed through the NPDES programs and the Underground Injection Control (UIC) regulations. This is a significant water quantity pathway that was barely discussed. 	<p>These comments have been incorporated into the revised Topic Forum discussion paper (Sections S1, S2, P1, and P2).</p>

Comments	Response
<p>Forests and Forestry (missing).</p> <ul style="list-style-type: none"> • The paper omits any discussion of the importance of forests and forestry to water quantity. • Need to discuss the difference between Mature forests and regenerating forests in their ability to store water which is critical to sustaining late season base flows and to moderating high flows. In mid-elevation rain-on-snow zones, one of the most quantitatively significant predictors of runoff is surface wind speed, which is dramatically affected by the presence or absence of mature, contiguous forest cover (U.S. Army Corps of Engineers. 1998. Engineering and Design. Runoff from Snowmelt. Manual No. 1110-2-1406). It is not just about seral stage (i.e., harvest), but also the effects of forest road networks on high flows in particular. We know a lot about the run-off side as it is integrated into models like DHSVM (Distributed Hydrology Soil Vegetation Model). 	<p>This comment is addressed in the land use/habitat topic discussion paper. Revisions to Section S1 of the Water Quantity paper acknowledge that changes in forest cover impact the timing of flows.</p>
<p>Tertiary Treatment / Water Reuse / Reclaimed water (underemphasized):</p> <ul style="list-style-type: none"> a) Water reuse could have a sizable impact on water supply and should be addressed in this paper. b) Reclaimed water is a potential source of water that can provide environmental benefits and allow us to better manage our water resources. c) The Partnership should focus the discussion of reclaimed water on value. This would allow for continued consideration and discussion of important costing, pricing, and customer impacts to water purveyors – but within the context of the gain to the region by the production and use of reclaimed water. d) Future discussion of reclaimed water uses needs to include those uses where the end uses of reclaimed water are not likely to have a set of “paying customers” (e.g., stream flow augmentation, groundwater recharge, wetlands enhancement, and wetlands restoration). e) Discussion of reclaimed water should also include discussion of past two years' legislation, December 2007 Ecology report to the Legislature, and current reclaimed water Advisory Committee work. King County has just completed a Feasibility Study that can provide useful information on this. 	<p>a) and b): These comments have been incorporated into sections S2, P1 and P2 and discuss reuse as a demand management strategy.</p> <p>c) and d): This comment should be addressed primarily in the Water Quality Topic Forum discussion paper. However, some changes were incorporated into the revised discussion paper in Section P1 -D. Additional discussion regarding institutional barriers and cost effectiveness are being addressed through other efforts being conducted by the Partnership. Outcomes from these efforts will be integrated with the findings from the topic forums in development of the Action Agenda.</p> <p>e) This comment is broadly addressed in the water quality topic discussion paper. This</p>

Comments	Response
<p>See http://dnr.metrokc.gov/wtd/reuse/docs/FeasibilityStudy/index.htm .</p> <p>f) We are also concerned about generating more support for reclaimed water in upper management of both Washington Departments of Ecology and Health, and the inability to date of Ecology to resolve its own internal policy conflicts between the water quality program and the water resources program on broader use of this potential resource.</p>	<p>comment has not been incorporated into the revised Water Quantity Topic Forum discussion paper at this time. The comment addresses a level of detail that is beyond the scope of the topic forum discussion draft. Refer to other parts to the process for future work.</p> <p>f) Reclaimed water has been identified as a mechanism to achieve additional groundwater recharge; institutional barriers have also been identified as an obstacle to implementation; this has been acknowledged in Section P1.</p>
<p>Non-potable uses (underemphasized)</p> <ul style="list-style-type: none"> • Non-potable uses are only mentioned in response to Policy Question 2, and then it is limited to use of reclaimed water to satisfy non-potable needs. No mention is made of water losses due to leakage, inefficiency, or issues surrounding irrigation or industrial uses. 	<p>Efficiencies and water losses are addressed in Sections S2, P1 and P2. Non-potable uses such as maintaining instream flows are addressed in all sections of the paper. Reclaimed water is also addressed in the water quality topic discussion paper.</p>
<p>Low Impact Development (especially rainwater harvesting) (underemphasized)</p> <ul style="list-style-type: none"> • LID is underemphasized primarily due to the stormwater issue being addressed in the Water Quality Topic Forum. However, water quantity elements are not addressed in that forum. 	<p>This comment has been incorporated into all sections of the revised Topic Forum discussion paper.</p>
<p>Dam operations and normative flows (underemphasized)</p> <ul style="list-style-type: none"> • Paper needs to recognize the threat that the loss of high channel forming flows have on river sustainability. Erosion is a key process that delivers sediment and nutrients into Puget Sound as well as providing flushing flows to lower mainstem river systems. Please include this feature as a threat and theme to the water quantity discussion. • The discussion draft does not identify dams as a source of disruption to sustainable flows (see, e.g., p. 40). • There are dams on rivers throughout the Puget Sound basin and the lack of discussion of the impact of dams on instream flows is a substantial deficiency in the report. 	<p>This comment has been incorporated into Sections S1-A and S2-A and P1 and P2 of the revised Topic Forum discussion paper.</p>

Comments	Response
<p>Flood control and implications (missing)</p> <ul style="list-style-type: none"> • Missing until it is mentioned as Strategy 3b on page 43. 	<p>This comment has been incorporated into the revised Topic Forum discussion paper.</p>
<p>Differentiation between water withdrawal and consumptive use (missing)</p> <p>a) Paper needs to differentiate between water withdrawal (water pumped from the ground or diverted from a surface-water source for use) and consumptive use (the portion of a withdrawal that is evaporated, transpired, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the water environment).</p> <p>b) The threat from current and projected consumptive use appears to be overemphasized, while the threat from non-consumptive use of water withdrawals (wastewater) is under emphasized. For illustration, the consumptive use of combined domestic and public supply in the Great Lakes basin is between 10 to 20 percent of the withdrawals, meaning that 80 to 90 percent of the water withdrawals is not used (http://pubs.usgs.gov/sir/2007/5197/). A similar regional-scale study has not been done for Puget Sound, but those Great Lakes basin estimates are typical for humid temperate climates.</p> <p>c) Recognizing the difference between consumptive use and water withdrawals (and careful use of the terminology in the document) suggests some novel and potentially effective solutions to water availability issues in Puget Sound, as described below in comments related to “Strategies to continue, add, or change.”</p>	<p>a) and c): A discussion of consumptive and non-consumptive uses has been added to the revised Water Quantity Topic Forum discussion paper. See Sections S1-A, P1-E and P2-E.</p> <p>b) Additional discussion on consumptive and non-consumptive uses that distinguishes how wastewater is returned to the watershed under rural and urban uses is provided in Section S1. In addition, discussion about decentralized treatment and return of wastewater and stormwater is provided in P2. Additional data needed to quantify these uses is not currently available.</p>
<p>Population Growth (underemphasized)</p>	<p>Population growth has been acknowledged as a significant threat to water quantity in Section S1 of the Water Quantity Paper. The authors attempted to characterize the threat as accurately as possible as framed by existing information. As additional information becomes available, the Partnership will incorporate this information into its management strategies.</p>

Comments	Response
Climate Change (underemphasized)	Climate change has been acknowledged as a significant threat to the availability of freshwater resources in Section S1 of the Water Quantity paper. It is acknowledged that as additional information becomes available, the nature and magnitude of the threat may be modified, along with proposed management approaches.
Differences between urban/rural communities was not adequately addressed	This comment has been incorporated into the revised Topic Forum discussion paper in Section S1-A, P1-E and P2-E.
The impacts of loss of wetland habitat, both freshwater and marine (underemphasized)	This comment is addressed in the land use/habitat topic discussion paper. Loss of wetlands has been identified as a primary threat to Water Quantity/Freshwater resources in Sections S1-E, P1-A and P2-A.

Current Regulatory / Program Effectiveness

Comment	Response
<p>Effectiveness of existing programs is not well addressed: a systematic review is needed to look at institutional barriers.</p>	<p>Institutional barriers are being addressed through other efforts being conducted by the Partnership. Outcomes from these efforts will be integrated with the findings from the topic forums in development of the Action Agenda. A systematic review of the effectiveness of all existing programs addressing water quantity is outside of the scope of the work of this Topic Forum.</p>
<p>The memo identifies a number of tools and strategies, most of which the state has the authority to implement now. The memo should discuss why those tools and strategies are not already being used, particularly at the state agency level (e.g., is it a resource issue? Priority issue?)</p>	<p>Institutional barriers have been identified as a potential obstacle to implementation in Section P1 of the Water Quantity Paper. This issue is being evaluated by the Partnership in a broader context, and will be incorporated into an overall strategy as part of the Action Agenda. A discussion of the limitations of some tools is provided in Section P1.</p>
<p>The paper uses the word “effective” to describe some strategies, without stating how that strategy is effective, or what criteria are being used.</p>	<p>A definition of effectiveness has been included in revised discussion paper S2.</p>
<p>The paper needs to clearly state that there is currently no water resource management strategy at the state or regional level. The set of measures listed under Question 4 are, for the most part, already required or authorized under state law, and state agencies have simply not acted. Particularly noteworthy is the recommendation that Ecology require metering of 80% of the withdrawals in each basin, since they are already under court order to do that in fish-critical basins, after a lawsuit was filed against them for not following the law that requires them to meter (and the judge held that inadequate resources was not a sufficient defense).</p>	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P2. This comment will also be addressed as part of synthesizing findings from the individual topic forums into ecosystem-wide priorities.</p>
<p>Paper should address the distinction and effectiveness between incentive- and regulatory-based management approaches</p>	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P1.</p>

In Stream Flow Protection

Comment	Response
<p>The effectiveness of instream flow setting alone as a management tool is over emphasized.</p> <ul style="list-style-type: none"> a) Instream flow rulemaking, under current processes, is inadequate to restore flows. b) The rules grandfather existing rights and fail to control future water use, including exempt wells and enforcement to prevent illegal use. c) Instream flow setting is a good tool for quantifying ecosystem water demand and for establishing a water right to meet that demand, but it does not facilitate finding ways to meet that demand. d) The effective element of the newer instream flow rules (those that also limit future water withdrawals and exempt wells) is that they go the next step and apportion available water between the quantified instream and out-of stream uses. 	<ul style="list-style-type: none"> a) The comment is addressed in S1, S2 and P1. b) The comment is addressed in S1 and P1. c) The comment is addressed in S1 and P1. d) The comment is addressed in S1, S2 and P1. <p>Additional management tools have been included in the revised discussion paper, including tools to address stormwater quantity and impacts from stormwater on stream flows.</p>
<p>The proposals for action are not sufficient to establish targets for and implement instream flow protections that will be effective in protecting freshwater and associated marine resources.</p> <ul style="list-style-type: none"> • New concepts and innovation in water management are needed – status quo will not work. • Agree with the proposal to recognize tribal reserved rights, however. 	<p>P1-D acknowledges that status quo won't work. Follow-on discussion in P2 recommends revisions to existing tools and fundamental realignment of policy and regulation (see P2-E).</p>
<p>The WRIA-based instream flow rulemaking process has a number of very serious flaws. These include:</p> <ul style="list-style-type: none"> • The WRIA rules are not based on adequate science. The rules that were adopted in the late 1970s and early 1980s were largely based on compromise, rather than credible science. There is some allusion to this in the paper, but it needs to be more explicit. • The recent round of rulemaking is also failing to lead to scientifically sound instream flows. The flow regimes set forth in these rules (1) generally do not protect or even address the variability necessary to maintain healthy streams (which the discussion draft itself notes is necessary, see pp. 3, 18, 19), (2) do not establish a recovery standard 	<p>This comment has been addressed in the revised topic forum paper. P1 acknowledges the inadequacies of past instream flow rules and the limitations that Wa water law places on the ability to address instream flows. P2 recommends updating all instream flow rules and considering water management tools to address growth and associated water use and estuary needs. The authors recognize that updating rules alone will not address problems of over-allocation and degraded instream flow and do not imply that it will in the Water Quantity Topic Forum</p>

Comment	Response
<p>adequate to meet Endangered Species Act habitat requirements, (3) allow for reserves for future out-of-stream water use that have no scientific basis, i.e., the reserves are based on arbitrary percentages regardless of habitat degradation or limitations, and (5) are, in some watersheds, based on compromise rather than science.</p> <ul style="list-style-type: none"> • The devolution of authority over streamflow setting, from the state to local entities, virtually ensures compromise on flows. In some areas, notably the Quilcene-Snow and Dungeness watersheds, the process of instream flow rulemaking has become so controversial that it has ground to a stalemate. It is hard to imagine that credible, habitat-protective flows will come out of this process. • The WRIA rules place instream flow protection at the bottom rung of the ladder of priority in the water rights system. As a result, all previously issued out-of-stream water rights (including municipal inchoates, discussed in Paragraph 4, below), may be exercised to the detriment of stream flows. While the discussion draft acknowledges that many instream flow targets are not being met (p. 7), it nonetheless recommends that the policy solution is to adopt such flows in all watersheds. This is nonsensical. • A related problem is the assertion that WRIA-based instream flows are acceptable because they will control future water right permitting (see pp. 19, 27, 30, 31, 40). First, this is incorrect because the new generation of rules now explicitly reserve water for future out-of-stream use. Second, and more importantly, with hundreds of thousands water permits and claims already on file, it is simply too late to rely on these rules as protective of streams. Their future effect is irrelevant to the problem that has led to the creation of this very Topic Forum. • The recommendation (p.4) to set new flow rules fails to acknowledge the problems described above. Updating rules alone will not address problems of over-allocation and degraded instream flow. Recommend that the discussion draft be amended to fully describe the inadequacies of the current instream flow rulemaking program, and recommend alternatives that will result in effective change. 	<p>paper. Additional management strategies are recommended in P2 that address baseflows (eg., stormwater quantity management tools).</p>

Comment	Response
<ul style="list-style-type: none"> Revisiting adopted instream flow rules at a time when numerous basins don't have rules seems questionable. It would make the most sense to identify specific basins where instream flows MOST IMMEDIATELY impact the health of the Puget Sound and then identify strategies including, but not limited to, instream flow setting/adjustments, needed to improve the Sound's health. 	<p>The criteria in P2 recommend prioritizing based on urgency of threat. Setting flow rules in basins without current rules has been identified as an immediate need. Revising flow rules in basins where they already exist has been identified as a short term need. See P2.</p>
<p>Water Supply Management Plans</p> <ul style="list-style-type: none"> Need to move out of the planning context into implementation. Cannot be forever consigned to stakeholder meetings that fail to achieve action on streamflow restoration, while humans (through inchoate, illegal and permit-exempt wells) continue to take water out of the system. 	<p>Illegal water use and permit exempt wells have been identified as a significant problem in the region (see P1). Recommendations to address these issues are provided in P2.</p>
<p>The Municipal Water Law is an impediment to protection of instream flows: The discussion draft references the municipal water law (p. 26) but fails to acknowledge that one key element of the MWL, set forth in RCW 90.03.330(3), validates large paper water rights. These paper rights represent water that is currently flowing in rivers and hydraulically connected aquifers. As municipalities grow into these rights, the additional pumping will not only exacerbate instream flow deficiencies, but will also consume water that has been restored to enhance stream flows. Inchoate municipal water rights represent a major, destructive impediment to restoration of freshwater habitat, a problem that should be acknowledged and discussed in the discussion draft.</p>	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P1.</p>
<p>The term human demand needs re-definition:</p> <ol style="list-style-type: none"> It is important to distinguish between human need for versus enjoyment (p. 25) of water. Humans need 50 liters of water per day for drinking and sanitation purposes. Beyond that quantity, demand is elastic and responsive to methods of control. Recommend that the PSP Water Quantity Forum take a very close look at quantification of future out-of-stream water demand before predicting that problems exist or will inevitably occur in meeting that demand. 	<ol style="list-style-type: none"> This comment is best addressed in broad policies and priorities being addressed by the Partnership as a whole, and is not specific to the water quantity topic. Agree that Partnership should look at this in more detail as part of its Action Agenda.

Comment	Response
<p>The paper muddles the issues of providing for freshwater habitat protection and providing for future human use:</p> <ul style="list-style-type: none"> • A related problem arises from the intertwined discussion of measures necessary to provide for restoration and protection of instream flows, versus satisfying human water demand in Puget Sound (see, e.g., p. 22 (Section S2(D))). These are two very different, largely competing objectives that will be achieved through differing measures and activities. The discussion draft, if it is to address both of them, should distinguish between the two goals in all aspects of the paper, and where appropriate, explicitly describe the trade-offs between one and the other (as for example, occurs with the WRIA rule reserves). 	<p>Comment noted. These competing objectives are recognized by the core team. The topic forum discussion paper attempts to describe the competing uses and needs and tradeoffs as currently understood. The water quantity topic forum recommends that the Partnership address these competing demands in future phases of the Action Agenda.</p>
<p>Water pricing is the most effective mechanism to control demand, but is not addressed in the discussion draft:</p> <ul style="list-style-type: none"> • If you wish to encourage people to use less of a resource, make them pay for it. The higher the price, the less they use. The current situation with gasoline prices reveals the truth of this statement, with increased fuel prices leading to increases in transit ridership and demand for fuel-efficient cars. • Increased pricing is perhaps the most effective method to control water consumption. Yet the discussion draft fails to acknowledge or explore this important mechanism as a demand management strategy. 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Sections S2 and P1.</p>
<p>Conservation is a key mechanism to address out-of-stream water deficiencies:</p> <ul style="list-style-type: none"> • This topic should receive even more prominence in the document. The draft correctly notes that the water conservation element of the municipal water law (i.e., implementation of the DOH water use efficiency rule) will not lead automatically to actual conservation because the rule contains no mandatory targets and purveyors are allowed to self-select their level of compliance. Water conservation standards should be adopted into rule and there should include a recommendation for legislative support (both programmatic and budgetary). 	<p>This comment has been incorporated into the revised Topic Forum discussion paper. Research and policy information pertaining to conservation has been expanded in the revised Water Quantity discussion paper.</p>

Comment	Response
<p>Ambient groundwater monitoring is a necessary step to understanding water supply issues:</p> <ul style="list-style-type: none"> • Ambient groundwater monitoring is necessary. A bill that received hearing in the 2008 legislative session, HB 2477, proposed the creation of a groundwater monitoring program but was not passed. Important support documents and key testimony were offered at hearings, and may be useful to establish the basis for recommending a groundwater monitoring program, which received bipartisan support in the legislative process. Also, distinguish between monitoring groundwater quantity (rather than quality) in the paper. 	<p>Paper S1 acknowledges the gap in our understanding of groundwater levels, trends and depletion on a regional scale. Paper P2 proposes a groundwater monitoring program to address this data gap.</p>
<p>Enforcement against illegal use is not adequately discussed:</p> <ol style="list-style-type: none"> a) Regulation of illegal water use holds potential for improving water supply issues and should be more prominently discussed. b) The proposal to rely on local watershed planning groups to implement compliance and enforcement programs is not realistic (p. 43, Strategy 4a). Most of the plans created by these groups call for the state to undertake enforcement. Resources for such activities are not available locally and would not be supported locally. c) The discussion draft makes the common error of assuming that water rights enforcement is necessarily tied to the inability to determine validity of water use claims, leading to a recommendation that the state undertake adjudication of water rights (pp. 30, 32, 44 (Strategy 5c), 45). If we wait until the state has adjudicated the validity of all of the claims filed in its water claims registry, the salmon will be long gone, the glaciers receded and possibly even returned. d) The fix is not found in the courts, but in the legislature, where restoration of Ecology’s ability to enforce against claims (and the budget to do it) may be found. e) A quantity-based tax or fee on water use claims would go far to clean up the database and reduce the number of rights claimed to Puget Sound streams and rivers. Again, pricing is key. 	<ol style="list-style-type: none"> a) This comment has been incorporated into the revised Topic Forum discussion paper. b) The proposed strategy in P2 is to coordinate with local watershed groups, not rely on them for enforcement. P2 also recommends compliance and enforcement plans and associated funding to ensure enforcement of water use. c) This comment has not been incorporated into the revised Topic Forum discussion paper at this time. The comment addresses a level of detail that is beyond the scope of the topic forum discussion draft. P2 also recommends compliance and enforcement plans and associated funding to ensure enforcement of water use. d) This comment has not been incorporated into the revised Topic Forum discussion paper at this time. The comment addresses a level of detail that is beyond the scope of the topic forum discussion draft. e) This comment has not been incorporated

Comment	Response
	<p>into the revised Topic Forum discussion paper at this time. This comment represents an opinion. As more documentation about this issue becomes available, this comment could be reconsidered.</p>
<p>Metering (or the area of accountability in general) is not adequately discussed;</p> <ul style="list-style-type: none"> • There are a number of national studies showing the effectiveness of metering in achieving water conservation • Metering of 80% of water rights in all streams that support salmon is a good idea. • Metering is a statutory requirement, and has been accomplished via a court order obtained in a lawsuit brought by CELP and other environmental groups, followed by concerted monitoring of Ecology’s response to the court order. • Metering and reporting of water usage data must be much broader than recommended. • Metering generally does promote conservation, even if bills are not based on usage • Office of Drinking Water’s role in water use efficiency should be noted and highlighted. • Recommend 100% metering in salmon-critical watersheds, including groundwater withdrawals, permitted and exempt, that remove water from aquifers that are hydraulically connected to streams. Don’t establish milestones or goals that have already been reached (e.g., Strategy 4c at p. 43) which would lead to a false impression of accomplishment by the Partnership. 	<p>The revised topic forum discussion paper addresses the water use efficiency rule and associated DOH requirements (P1). Metering recommendations are included in P2; however the topic forum workgroup did not feel requiring 100% metering was achievable. The conservation discussion in the revised topic forum paper has been expanded in S2 and P1 and addresses the effectiveness of price and rate structures that are dependent on metering.</p>
<p>Exempt wells need to be identified and better managed::</p> <ul style="list-style-type: none"> • Exempt wells are an uncontrolled factor in water supply development, and that these wells undermine effective water management. The paper should go further and note that exempt wells can cause substantial adverse cumulative impacts on environmental resources, particularly in smaller 	<p>Issues concerning exempt wells and the need to regulate them are discussed S1, P1 and P2.</p>

Comment	Response
<p>stream systems. The paper should also record that proliferation of exempt wells is not inevitable, but may be controlled under prior appropriation principles (i.e., citation only to the exempt well statute, without reference to case law that further defines the exemption is insufficient to define the scope of the problem and possible solutions).</p> <ul style="list-style-type: none"> • Management by Ecology does not resolve the issue. Further, simply .regulating. exempt wells is not a sufficient control. • A general permit for exempt wells will not address the problem, which would allow continued proliferation of such wells regardless of impacts on water resources. 	
<p>Exempt wells: need for quantification and monitoring:</p> <ul style="list-style-type: none"> • We appreciate the Partnership's recognition of potential impacts related to exempt wells and applaud the Partnership's proposal to quantify and monitor cumulative water usage by exempt wells and to evaluate groundwater available for future use by all water users. This is particularly critical in San Juan County, where there is a growing trend to install a single well and then utilize the maximum exempt amount of 5,000 gallons per day for multiple off-site connections to that well. As such wells draw down groundwater levels, where a geohydrological connection exists between the groundwater and surface water, surface water flows likely will also decrease. • In the absence of opposition to a local water withdrawal application, wells may be constructed without demonstrating with scientifically-defensible evidence that sufficient capacity exists for proposed connections, much less existing users of the water source. The Partnership needs to examine the well permitting practices that occur at the local level to determine whether they are designed to ensure that proposed withdrawals do not adversely impact current users. This issue is particularly pressing along shorelines, where saltwater intrusion may result from overburdening existing wells, and where such intrusion may then adversely impact the marine environment. 	<p>Issues concerning exempt wells are discussed S1. Strategies for dealing with the issues are provided in P2. The role of the Partnership in addressing exempt wells will need to be determined. Some of the recommended strategies will be implemented by other entities.</p>

Comment	Response
<p>Robbing Peter to pay Paul:</p> <ul style="list-style-type: none"> The discussion draft contains a number of proposals for solutions that involve taking water from one system to enhance another. The draft should contain cautions about such approaches including pump and dump (p. 29) and the mitigation program for the Deschutes basin in Oregon (p. 30), which allows for transfer of mitigation of water from one sub-basin to another without regard to impacts to the sub-basin of origin. 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P1.</p>

Watershed Plans

Comment	Response
<p>Watershed plans are too inconsistent and water-supply focused to serve as a reliable source of information or planning to restore Puget Sound freshwater resources. Local watershed planning units will not support enforcement against illegal water use.</p>	<p>Inconsistencies in the types of information addressed in watershed planning are addressed in S1 and P1. We agree that it is not the role of watershed planning units to provide enforcement to address illegal water use.</p>
<p>Watershed plans do not necessarily provide sound information relating to water supply.</p> <ul style="list-style-type: none"> Many WRIA plans do not meet even the basic statutory requirements set forth in RCW Ch. 90.82 and are inadequate as a source of information concerning water budgets and future water supply requirements. We caution that the Forum should not engage in blanket reliance on these plans, but should evaluate them on a case-by-case basis to determine whether the information they contain is reliable. The report’s conclusion that most plans address data gaps is unsupported. The notion that local recommendations could form an important foundation for a regional approach to freshwater management (p. 28) is not supported by the plans themselves. 	<p>Agreed. S1 discusses the limitations to using watershed plans to develop a region-wide assessment of water quantity and P1 discusses the inconsistency of information available across watersheds from various watershed planning efforts. The water quantity core group agrees that watershed wide and or ecosystem wide planning is needed.</p>

FERC

Comment	Response
<p>FERC relicensing process is overstated as a successful tool for achieving flow objectives.</p> <ul style="list-style-type: none"> • The document oversells the FERC relicensing process. The FERC hydroelectric relicensing process is better than nothing, and in some cases has led to better outcomes than might be achieved otherwise • For example, the Lewis River Swift No. 1 project in southwest Washington is used as an example of a ‘successful’ process that led to improved flows. Since the project was completed 50 years ago, it has completely dewatered a significant stretch of the river, except for intentional seepage through the earthen dam and massive flows during spill conditions. The reach historically featured mean low flows in the 700-800 cfs range; the negotiated settlement provides seasonal flow releases of less than 100 cfs. 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section S2.</p>
<p>The FERC relicensing process outcome depends on a number of factors:</p> <ul style="list-style-type: none"> • Project configuration (e.g., mainstem dam vs. off-channel diversion), • capacity (i.e., how many megawatts), • project purpose (e.g., power-peaking versus base load), • ownership, • suite of affected resources, and • the willingness of state and federal agencies to push for meaningful flow improvements. 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section S2.</p>

Comment	Response
<ul style="list-style-type: none"> Given that FERC licenses are issued for very lengthy periods, putting a fixed amount of water for flows into the FERC license, and not examining the sufficiency of that flow regime periodically for effectiveness, is problematic. For some FERC-licensed facilities, the flows established 20 or 30 years ago may be inadequate in an ESA-recovery era. The paper should consider including references to FERC licenses and a renewal schedule, and identify advocacy by the state during those renewals as a strategy to remedy inadequacies under existing FERC license conditions. 	<p>This comment has not been incorporated into the revised Topic Forum discussion paper at this time. The comment addresses a level of detail that is beyond the scope of the topic forum discussion draft. Refer to other parts to the process for future work.</p>

Effective Programs

Comment	Response
<p>Programs that increase in stream flows –</p> <ul style="list-style-type: none"> King County has some data regarding Chinook population increases on the White River subsequent to increases in stream flows there. 	<p>Much of the data that indicates fishery response to flow is unpublished and was difficult to access. This information will be considered in quantifying flow needs for Chinook as part of the recommendations in P2.</p>
<p>King County’s Vashon Maury Island Water Resources Evaluation –</p> <ul style="list-style-type: none"> this evaluation modeled the contribution of groundwater to Puget Sound from VMI. The technique used on VMI could be adapted to other rural areas to gain a better understanding of the magnitude of total groundwater contributions to the Puget Sound. The VMI WRE information can be accessed on the web at: http://dnr.metrokc.gov/wlr/WQ/vashon-island/ 	<p>This information could be used in future evaluations, however, it is provided at a level of detail too specific for inclusion in the paper.</p>
<p>Would like to see the Comprehensive Irrigation District Management Plan (CIDMP) program added to Table P1-1.</p> <ul style="list-style-type: none"> This program provides for agricultural landowners/irrigation to develop area wide plans for WR management. It is a voluntary program that is engaging these landowners in collaborative solutions for irrigation water use and instream/resource improvements. 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P1 and is included in Table P1-1.</p>

Comment	Response
<p>Rainwater Harvest –</p> <ul style="list-style-type: none"> In addition to the programs in San Juan County and the City of Seattle, the Department of Ecology has done a study on the potential benefits of rainwater harvest in the Barker Creek Watershed of Kitsap County. Doug Wood at the Northwest Regional Office DWO0461@ECY.WA.GOV can provide details on the study and conclusions. 	<p>Rainwater harvest has been incorporated into the revised Topic Forum discussion paper.</p>
<p>Desalinization –</p> <ul style="list-style-type: none"> The paper recommends desalinization as one solution to address decreasing freshwater supplies; however, not enough is known yet to allay concerns regarding potential harm to saltwater ecosystems (nor other issues associated with desalinization, including high energy costs and associated potential increases in greenhouse gas emissions). We need to be careful not to cure one problem by creating a larger one elsewhere in the system. 	<p>Concerns regarding desalinization have been acknowledged and incorporated into the revised Topic Forum discussion paper in Section P1.</p>
<p>Acknowledge and include information that Municipal Water Providers with 1,000 or more connections, or who are deemed by the Department of Health as “growing,” must develop and adopt water conservation plans for the system and end users. No such other required efficiency plans are mandated at this time.</p>	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P1.</p>

Goals / Drivers

Comment	Response
<p>The goals/drivers of water quantity need to be identified in this paper. The two main goals should be:</p> <ol style="list-style-type: none"> the region’s quality of life (i.e., out of stream water supply needs) retention/restoration of natural conditions in the regions water bodies. <p>(These are often competing demands for water, but both needs should be identified and addressed in the paper)</p>	<p>This comment will be addressed as part of synthesizing findings from the individual topic forums into ecosystem-wide priorities.</p>
<p>The focus should be on understanding the scale of impairment and its implications rather than on finding some 'adequacy' threshold to apply. The discussion should explicitly note the need to provide flows designed to achieve “recovery” of listed species under the ESA.</p>	<p>Science linking VSP parameters to flow is addressed in Sections S1 and P2, and has been identified as a strong recommendation.</p>

Supporting Data / Statistics

Comment	Response
<p>Industrial/Commercial use statistics –</p> <ul style="list-style-type: none"> The statistics regarding current levels of water use and the projections due to population growth do not include any discussion of industrial/commercial use, their likely trends over time, or efforts/incentives for conservation. In the most populated portions of Puget Sound, domestic use is by far the largest category of water consumption – in King County it is roughly 15 times as high as industrial use (Lane 2004, cited in paper), but statewide the rates are essentially equal for the two categories. 	<p>Water use by sector has been incorporated into the revised Topic Forum discussion paper in Section S1.</p>
<p>Provide statistics and discussion regarding water consumption, and how it varies across the Puget Sound landscape.</p>	<p>A general discussion of how consumptive domestic uses vary regionally (urban versus rural uses) has been included in Sections S1 and P1. More detailed data quantifying water use regionally is not currently available. Recommendations in P2 address the need for a regional summary of water consumption.</p>
<p>The Climate Change study used in the issue paper does not have results that can be used for lowland rain-driven stream systems.</p> <ul style="list-style-type: none"> Instead, the results are more targeted towards snowpack-driven systems. The models have a focus on temperatures, and data shows a definite upward trend. Consequently, general forecasts of snowpack levels are being made, and ranges of flow levels for mountain rivers can be derived. However, those models do not appear to have the capability to forecast longterm local participation patterns (for a lowlands area such as Kent). 	<p>S1 includes the climate change modeling results that are currently available. There are limitations with using results from snow driven systems and models for the lowland system analysis. More sophisticated information should be included as it becomes available.</p>
<p>Streamflow data – More work needs to be done on streamflow data.</p> <ul style="list-style-type: none"> Water Supply stream flow data must be seasonal as well as annual if it is to touch such concerns as the cycle of one-in-ten year droughts, Salmon spawning needs (Habitat, p. 6), etc. There are three existing national level USGS programs that generate data and understanding to help address many of the identified threats; the National Water Use Program (http://water.usgs.gov/watuse/wunwup.html), the National Streamflow 	<p>Additional streamflow data has been added to the S1 section of the revised water quantity topic forum paper. See also Figure S1-1. This comment also presents information that is related to the Partnership’s objectives for the water quantity topic, but can not be fully evaluated during the first phase of the Action Agenda. The water quantity topic forum</p>

Comment	Response
<p>Information Program (http://water.usgs.gov/nsip/), and the newly initiated Water Census Program (http://pubs.usgs.gov/fs/2007/3112/fs2007-3112.pdf). The water census has the objectives to provide citizens, communities, natural resource managers, and policymakers with a clear knowledge of the status of their water resources, data on trends in water availability and use over recent decades, and an improved ability to forecast the availability of freshwater for future human, economic, and environmental uses.</p>	<p>recommends that the Partnership consider evaluating this issue, suggestion, study, etc. in other components or future phases of the Action Agenda.</p>
<p>The question “Where is supply inadequate?” is not answered.</p> <ul style="list-style-type: none"> • The paper skirts around saying that there is no answer today. We may speculate, but even as Ecology’s stream and basin closures and water rights attempt to address and prevent this, no specific areas were listed in the paper. We should admit that we don’t “know” – a very large gap indeed. 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section S1.</p>
<p>Water-use data for all Washington counties and “water-resources cataloguing units” (major river basins) are compiled, estimated, and documented once every five years (starting in 1985) as part of the USGS National Water Use program (http://water.usgs.gov/watuse/wunwup.html).</p> <ul style="list-style-type: none"> • Data are available on ground-water status and trends, although the document is correct in that the data are not comprehensive for all areas and has not been compiled for the entire region. To facilitate assembling such data, the USGS recently compiled a bibliography of their publications concerning water resources in Puget Sound (http://puget.usgs.gov/pubs.html). 	<p>A summary of the county-wide water use data based on the USGS water use estimates (Lane, 2004) was added to S1. Annual streamflow data from the USGS is also included in Figure S1-1. The Partnership will incorporate the USGS studies on groundwater as more reports become available.</p>

Baseline / Indicators

Comment	Response
<p>Baseline indicators in draft document but many are not specific enough to translate into real indicators.</p> <ul style="list-style-type: none"> The reason for some are unclear based on background information presented in the responses to the previous questions (e.g., water temperature, impervious surface cover). 	<p>Information from the topic forum papers is one of a number of sources being used as part of the Indicators work being conducted concurrently by NOAA.</p>
<p>Baseline monitoring (“hydrology” and “fish surveys”) and “flow/biota relationships” are identified as one of the most important things to start immediately, but no other details are provided.</p> <ul style="list-style-type: none"> At a minimum, other biota in addition to fish should be included in any biological monitoring effort. 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P2.</p>
<p>A baseline of hydrologic information could be established for the Puget Sound basin using existing data coupled with an integrated numerical modeling system that fuses data from ground stations, instream flow information, and remotely sensed data.</p> <ul style="list-style-type: none"> In recent years, there have been significant improvements in the state of hydrologic models, data fusion, and our ability to interpret the output. Such an integrated baseline system would allow managers and policy makers to create scenarios for future flows, land-use planning, and expectations of climate change. We refer you to the Northwest Explorer website (http://nwexplorer.info/Default.aspx) for examples of this work. 	<p>There has not been full agreement that a numerical model of all groundwater and surface water interactions in the Puget Sound would provide the level of detail necessary to make management decisions. This comment is noted, and the need for such a regional scale model (and costs and benefits) should be addressed by the Partnership as future work progresses.</p>
<p>The assessment of baseline and future projections of freshwater flows should take into account present conditions and future changes in land cover, streamflow use and management, land use, and climate.</p> <ul style="list-style-type: none"> These changes would have to consider the myriad of possible impacts including: conversion of wetlands for agriculture and forest lands for development; road construction; wastewater and stormwater discharges; construction of dikes, levees, culverts; shoreline armoring; irrigation, crop and vegetation management; changes in precipitation regimes and streamflow peaks; extreme events like floods; changes in precipitation patterns including snowpack and snowmelt. 	<p>This comment will be addressed as part of synthesizing findings from the individual topic forums into ecosystem-wide priorities.</p>

Comment	Response
<p>There is very little knowledge of presettlement flows in most rivers and streams, and limited knowledge of flows going back more 50 years.</p> <ul style="list-style-type: none"> Despite the number of streams with gauging stations, we have little knowledge of the nature and dynamics of flows as they traverse the watersheds or enter the estuary. The paper focuses on salmonid health as a desirable endpoint; however there are other desirable outcomes, for example in the estuaries, the health of seagrasses is affected by changes in salinity, impairing the support of many other marine species. 	<p>Agreed, there are few data indicating the pre-settlement hydrologic regime. The period of record associated with streamflow measurements on major rivers flowing into Puget Sound are listed in Table S1-1 of the revised topic forum discussion paper. The paper has incorporated such recommendations within the umbrella of promoting ecosystem management.</p>
<p>A comprehensive monitoring program of surface water flows in streams and rivers, coupled with accounting of surface and groundwater withdrawals and the use and fates (consumption, disposal to ground or receiving waters) would be a good start.</p>	<p>Paper P2 suggests a groundwater monitoring program, an analysis of streamflow trends for rivers flowing into Puget Sound, and an assessment of water use and future water needs. The Partnership is developing a coordinated monitoring strategy for the Puget Sound under a separate process.</p>
<p>Comprehensive studies that would identify ecologically important flow components of stream, rivers, and wetlands would be another key component that could be developed alongside adaptive management actions to restore and maintain more natural flow regimes (and to a some extent water quality improvements along with them) for the benefit of aquatic biota. Monitoring the response of aquatic biota to these management actions would be a central component of these studies.</p>	<p>Paper P2 suggests studies identifying flow limitations and targets for fish, assessing the adequacy of flows for estuarine and nearshore habitats, and the identification and evaluation of flow improvement benchmarks.</p>

Document Content / Style

Comment	Response
Paper makes too many qualitative statements (not specific which statements); statements should be more closely linked/supported by quantitative research	The authors of the paper attempted to include only those recommendations supported by existing studies and data. This resulted in some conclusions which could be considered qualitative. As additional quantitative research becomes available, the Partnership will attempt to incorporate it as appropriate.
Paper needs to clarify its approach. Is it focused on water supply or holistic management?	This comment has been incorporated into the revised Topic Forum discussion paper as an upfront clarification (see context on page 1).
<p>Focus on Science-based Information and Actions:</p> <ul style="list-style-type: none"> a) Paper needs an even greater inclusion of science and documentation and perhaps fewer assumptions and related opinions. b) Data on the status of freshwater resources is largely lacking but is a key piece to accurately laying out this issue. Where factual evidence does not exist, the Partnership should determine priority areas for research and monitoring to meet the goal of scientific-based action and to assure that actions taken are not based on assumptions. 	<ul style="list-style-type: none"> a) The authors of the paper attempted to include only those recommendations supported by existing studies and data. This resulted in some conclusions which could be considered qualitative. As additional quantitative research becomes available, the Partnership will attempt to incorporate it as appropriate. b) Agreed. Additional data and analysis that address surface and groundwater and fish and habitat needs are included in P2 recommendations. The water quantity topic forum recommends that the Partnership consider evaluating this suggestion further as part of future phases of the Action Agenda.
<ul style="list-style-type: none"> a) Need to show that the solutions are correlated to documented scientific information regarding cost-effectiveness in solving problems that are clearly defined: b) The papers would benefit from a clear problem statements, e.g. too much 	a) S2 identifies solutions that have documented effectiveness. The partnership has a separate process looking at cost effectiveness

Comment	Response
<p>nitrogen, too warm temperatures in areas without adequate riparian cover, etc. Then solutions can be tied to those specific problems and a benefit-cost analysis can be done to determine the best solution to the problem. Without that, it runs the risk of providing shotgun solutions.</p> <p>c) Similarly, topic areas need to be concisely stated to avoid a large “parking lot” of problem statements, structured around some selected topic themes. Insight should be provided as to the origin of these topic themes and there should be factual information provided that reflects their relative strategic value; there needs to be a context provided through an overall problem statement.</p>	<p>b) Section P2 provides a problem statement that is tied directly to the threats identified in S1. Section P2 then provides recommended solutions to address the threats and overall problem statement.</p> <p>c) This comment has been incorporated into the revised Topic Forum discussion paper.</p>
<p>This paper addresses freshwater quantity, which is not the same as freshwater resources. Since the goal is to ensure adequate water quantity for humans and ecosystem needs, why not stick with the original title?</p>	<p>The title has been changed to “Water Quantity”.</p>
<p>In general, the paper was very readable and well organized. It does a good job of framing some of the key issues, challenges, and data gaps related to water resources in Puget Sound. However, it is unduly repetitive – the unique content could have been contained in a document less than half the size.</p>	<p>The structure of providing science as a basis for policy recommendations and the corresponding questions that form an outline for the paper does result in some repetition. We have tried to condense the information but also, wanted to have a comprehensive compilation in one paper.</p>
<p>Our current knowledge is limited related to the effects of water quantity and production of salmonids. However, we do know that every part of the hydrograph is important for native species, and understanding the tradeoffs made in accommodating high and low flow regimes is severely lacking. The initial discussion of memo of the “normative flow” regime recognizes this.</p>	<p>These limitations are acknowledged in S2. We agree that more research is needed.</p>

What did the Paper get Right?

Comment	Response
Overall, paper very well done and inclusive of the issues.	No changes suggested in the comment.
<p>The PSEC (Puget Sound Environmental Caucus) Water Quantity Committee applauds the inclusion of the following actions:</p> <ul style="list-style-type: none"> • Establishing instream flows in watersheds that currently do not have flow rules; revising outdated instream flows; connecting instream flows to the implementation of the Salmon Recovery Plan; and linking instream flows to the health of estuarine and nearshore habitat health • Pursuing strong instream flow and water policy compliance and enforcement measures, including establishing a water master in every watershed around the Sound and metering and reporting 80% of water use • Promoting demand management and implementing regulations and incentives for conservation, efficiency, and water reuse measures • Gathering useful and important data on the impacts of climate change on water resources • Recognizing the undeniable need to change the current legal and policy framework that perpetuates faulty water management practices • Integrating land use planning, watershed planning, ESA recovery planning, and other relevant aspects of water resource protection 	No changes suggested in the comment.
<p>The Discussion Draft does a good job of connecting the health of freshwater resources to the health of Puget Sound. In particular, the Draft stresses the importance of:</p> <ul style="list-style-type: none"> • The timing and amount of freshwater runoff into Puget Sound, • The role of freshwater inflows on marine and subtidal circulation patterns, • Saltwater intrusion in groundwater supplies, and • The role of impervious surfaces in decreasing the health of aquatic systems. 	No changes suggested in the comment.
The document rightfully stresses the need to create a statewide program that compiles and reports water use information, quantifies the impact from permit-	Section P2 includes strategies to develop water use and enforcement plans, establish water masters to enforce the water code, require

Comment	Response
<p>exempt well withdrawals, strengthens water right and illegal water use enforcement tools, and collects information on water system/supply management needs. However, it is important to emphasize the need for comprehensive analysis and monitoring in watersheds around the Sound. Without a significant investment in compliance monitoring, freshwater resource protection and prioritization of critical watersheds will be hindered. In addition, it is imperative that the State obtain resources to centralize existing information and gather additional data on the hydraulic continuity between groundwater aquifers and surface streams in localized areas.</p>	<p>metering and reporting of water use, and develop a groundwater monitoring program. Comprehensive analysis and monitoring is also included in ecosystem wide recommendations in Section P2.</p>
<p>The final policy question (or “Logical Conclusions”) regarding recommendations for action includes recommendations for understanding the influence of freshwater flows on Puget Sound nearshore and estuarine habitat and circulation (p. 42). This seems to be the first mention of these issues in the paper. This is an important issue as well and deserves more attention in the response to the Science questions. As a starting point, one might look at the Water Quantity Provisional Indicators Marine Circulation Conceptual Model developed by the Puget Sound Partnership’s Provisional Indicators Technical Work Group. The U.S. Department of Commerce (2007) reference cited in the draft also provides some information on this topic.</p>	<p>Freshwater flows as they impact Puget Sound salinity and circulation has been incorporated into the revised Topic Forum discussion paper in Section S1. Figure S1-1 indicates the relative contribution of flows to the sound.</p>
<p>The strategies proposed in response to Policy Question 2 (or Logical conclusions?) seem to be comprehensive and appropriately characterized. These strategies appear to go beyond the stated and implied scope of the previous sections and begin to address some of the elements that are missing from the draft (e.g., flood control, land use/cover, stormwater management, integrated water resource assessments).</p>	<p>Flood control, stormwater management and integrated water resource assessments are now incorporated into all relevant sections of the water quantity topic forum paper.</p>

Scope of Water Quantity

Comment	Response
<p>Focus should be on current and projected future human water needs as a pressure on aquatic resources that has implications for aquatic and riparian species, habitat, and water quality.</p> <ul style="list-style-type: none"> This approach would necessarily broaden the scope of the document (and turn the focus away from a utility-centric approach) and require incorporation of additional information and findings 	<p>Section P2 of the water quantity paper outlines an ecosystem approach of integrating water use (utility) planning, stormwater planning, land use planning and salmon recovery planning (and other natural resource planning). This approach is aimed at integrating these aspects and identifying potential tradeoffs. Much of the analysis to date has been in either the utility sector or the natural resource sector, and has not included an analysis of both needs together.</p>
<p>There is little to no discussion of flood management or stormwater as a water quantity issue. There is little mention of flood control and the effects of flood control on habitat-forming processes and aquatic biota.</p> <ul style="list-style-type: none"> References to discussions in other topic areas (water quality) are misleading, in that the water quantity aspects of these topics are not addressed in that topic paper. However, the discussion on the ecological benefits of maintaining a natural flow regime (including large floods) should be complemented with a statement on the benefits existing flood control measures provide. 	<p>Stormwater quantity management and flood control have been incorporated into all sections of the revised Topic Forum discussion paper. The water quality topic forum paper addresses stormwater quality.</p> <p>Additional discussion of the benefits of existing flood control measures has been added to Section S1.</p>
<p>The paper needs to address the impact on ecological resources of water supply enhancement through demand reduction and augmentation of low-flow through storage management, which is of significant importance for human uses of water. However the impact of these measures on ecological resources is less certain, and is not discussed.</p> <ul style="list-style-type: none"> Effective water resource management requires a multicomponent, multivalue optimization analysis. Current understanding of this process is based almost entirely on conceptual models; in order to understand and manage freshwater resources for many species, and many desirable endpoints, it will be necessary to create an integrated system of quantitative models that can be used for predictive purposes. 	<p>The water quantity paper supports an ecosystem based management approach (see Section P2). An integrated, quantitative optimization model that addresses optimum water use for human and ecological use may be one approach. The water quantity topic forum recommends that the Partnership consider evaluating this approach in future phases of the Action Agenda.</p>

Comment	Response
<p>It appears that this document is focused on water supply.</p> <ul style="list-style-type: none"> This paper could instead present a holistic picture of how humans alter historic flow patterns including land cover change, water supply/demand, wastewater treatment/reuse, and flood control. These pressures on aquatic ecosystems are all driven by the numbers and distribution of humans on the landscape. Policy decisions regarding land use, water supply/demand, flood control, and wastewater treatment/reuse should be made considering how all of these issues are interconnected and how they affect aquatic resources. For an example of a more holistic framework for looking at water quantity issues, see the Water Quantity Provisional Indicators Freshwater Quantity Conceptual Model developed by the Puget Sound Partnership’s Provisional Indicators Technical Work Group. A more holistic ecosystem-based approach is alluded to on page 31 (under Ecosystem Considerations) in response to Policy Question 1. 	<p>The revised water quantity topic forum paper attempts to provide a holistic picture of water resources for all watersheds draining to Puget Sound (See water quantity context page 1). The paper supports an ecosystem based approach that integrates land use, water supply/demand, flood control, stormwater and wastewater planning (including reuse) in a more holistic framework. See P2.</p>
<p>The paper would benefit from a broader perspective on the aquatic biota that need to be protected and restored in Puget Sound and its rivers, lakes, streams, and wetlands. It is focused too heavily on fish.</p>	<p>Agreed. Current data available are centered on fish and therefore, the paper has focused on fish. Section S1-G has been expanded to include data gaps to address this comment. This issue could be part of a longer-term comprehensive approach in future phases of the Partnership’s work</p>

Principles/Criteria that should be reflected in the strategies to address threats

Approach

Comment	Response
<p>Need a single, coherent water resource management strategy for the Puget Sound region. Such a strategy needs to be developed, either at the state or regional level, to make the rest of the proposed actions integrated and meaningful.</p>	<p>This comment will be addressed as part of synthesizing findings from the individual topic forums into ecosystem-wide priorities, as part of the Partnership’s work under future phases of the Action Agenda.</p>
<p>There is a need for a broad regional planning approach that allows for local site-specific, season specific approaches</p> <ul style="list-style-type: none"> • It is important to recognize the localized nature of solutions and to create actions that will garner support. Regionalization without clear value and justification risks failure, as we have seen in the past. Varied physical, geographic, climate and other natural conditions around the Sound, a range of values by stakeholders, and disparate access to resources, contributed to the challenge of rally around particular approaches and plans. • To make real progress in restoring Puget Sound, we must recognize those limitations and design solutions that work with those features. Force-fitting regional solutions where the value is not clearly spelled out and accepted by affected parties leads to energy spent on resistance, limited or no implementation, and consequently risks no real solution. • State law confines water planning to the ever separate natural drainage basins. There are good reasons for this, and yet the Puget Sound Basin is a collage of WRAs (sub-basins in this larger ecosystem context?). Resource management complexities might raise again the question whether interbasin approaches (such as supply system interties) are optimum, especially in urban areas where ecosystems and supply surpluses, deficits and options, are unevenly distributed. (Drawing from a different context of transportation and money pots, the “subregional equity” philosophy chiseled out by Sound Transit, all within a more flexible statutory language, probably should not be duplicated.) 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Sections P1-E and P2.</p>

Comment	Response
<p>Prioritization</p> <ul style="list-style-type: none"> • Programs need to be effective: prioritize with the most nexus for Puget Sound restoration • There are a number of proposed actions that could be implemented now, without further study (e.g., metering, compliance, exempt wells, reclaimed water). That would seem to be a likely criterion for making some initial investments. • The effects of land development (impervious surfaces) on watershed performances and stream flows may often be more significant than water withdrawals from wells or surface water diversions. This fact needs to be a key part of setting priorities for action and determining where the "best bang for the buck" can be found in improving watershed/quantity conditions. • Prioritize projects to address growth 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Sections S1 and P2.</p>
<p>Need to stress urgency - To further support the urgency to address water quantity needs for both people and fish, emphasize what NOAA Fisheries called for in its Final Supplement to the Shared Strategy's Puget Sound Salmon Recovery Plan, i.e., <i>“an urgent and inescapable need to ensure sufficient instream flows to recover Puget Sound Chinook salmon.”</i></p>	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P2.</p>
<p>Pricing / Economics is important for establishing criteria to address actions. Although paper explicitly states that the \$-question is not being evaluated / addressed, this topic is critical for analyzing and prioritizing actions / management approaches</p>	<p>The Partnership has a separate process to look at the cost effectiveness of actions.</p>
<p>Need to anticipate and proactively plan for future growth</p>	<p>Agreed. S1 discusses projections of water demand from future growth. Projected increases in water demand area also identified as a major threat. A consistent theme throughout the water quantity paper is a regional approach that ties land use and water supply.</p>
<p>Need to preserve ecosystem function</p>	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P2.</p>

Comment	Response
Need to be specific about end points/outcomes	Endpoints and outcomes will be addressed by the Partnership under a separate effort. This work is not part of the topic forums themselves.
Systematically link threats to strategies	This comment has been incorporated into the revised Topic Forum discussion paper in Section P1 and Table P1-1.

Institutional Barriers

Comment	Response
Paper should, in detail, discuss recognize institutional barriers, and how these barriers will impact future supply and flow concerns.	Issues relating to broad institutional barriers, are being addressed through other efforts being conducted by the Partnership. Some discussion of barriers is included in Section P1.
The paper should recognize the impact of budget cuts – for example, the federal budget reductions that are causing USGS to eliminate gaging stations. In addition, the Governor recently vetoed a budget proviso of slightly more than \$200,000 that would have begun the process of creating a statewide groundwater monitoring and assessment program—something that will be needed for fully understanding the water picture of the Puget Sound.	Recommendations in Section P2 address the need for adequate funding in order to effectively implement the recommended strategies.

Regulations

Comment	Response
Accountability at all levels is needed	Accountability is a separate charge of the Partnership and not addressed in the topic forum paper.
A more in depth discussion on regulatory structures (specifically GMA) and their relationship to water availability / allocation is needed. Focus on effectively implementing existing regulations before developing new ones.	This comment has not been incorporated into the revised Topic Forum discussion paper at this time. The comment addresses a level of detail that is beyond the scope of the topic forum discussion draft.

Comment	Response
<p>Rules and regulations vs. incentives:</p> <ul style="list-style-type: none"> • Before moving to new rules and regulations, incentives and innovative solutions should be given a chance to work. There are partnerships to be built between the public and private sector that can allow us to work together to solve problems. Rules and regulations can create divide, and potentially underestimates the intent of some. In addition, rules and regulations often attempt to apply universal solutions where they may not work or be the best solution. While the regulatory framework deserves examination, implementing incentives and crafting measurable goals and outcome expectations without laying down rigid requirements is a good first step. Problems must be clearly defined in order for related incentives to be successful. 	<p>Issues relating to broad institutional barriers, cost effectiveness, indicators, funding, and education/outreach are being addressed through other efforts being conducted by the Partnership.</p>

Standards

Comment	Response
<p>Instream flow standards need to be set, need to be presented in a broader context; recognize urban/rural differences, clearly state end-point, provide broad benefits</p>	<p>Comment has been addressed in Sections S1 and P1 with a description of urban and rural differences.</p>
<p>Paper should discuss standards for accountability of water systems management</p>	<p>This comment has not been incorporated into the revised Topic Forum discussion paper at this time. The comment addresses a level of detail that is beyond the scope of the topic forum discussion draft.</p>

Enforcement

Comment	Response
Exempt wells not adequately enforced; needs to be addressed	P2 proposes regulating exempt wells under a general permit and establishing water masters to enforce the water code.
To cover the regulatory spectrum, enforcement of illegal allocations should be addressed. Are current enforcement procedures (monetary fines) appropriate? Legislature needs to fully fund the Department of Ecology's programs to implement, monitor, and enforce existing environmental and water laws. Although incentive programs and voluntary measures play an important role in protecting water resources and should be sufficiently funded, the State's authority to manage water resources on behalf of the public must be reinforced in the Action Agenda to bring consistency, integration, fairness, and effectiveness to the system.	P2 proposes water use compliance and enforcement plans.

Actions that should be continued, added, changed, stopped

Management Needs / Tools

Comment	Response
Management tools should be mixed and matched to reflect local/geographic/seasonal/timing distinctions	This comment has been incorporated into the revised Topic Forum discussion paper in Section P2.
There are tools available now that could easily be implemented: this low hanging fruit should be picked: conservation, efficiency programs, monitoring, enforcement	This comment has been incorporated into the revised Topic Forum discussion paper in Section P2.
Partnerships need to be created at all levels: engage constituents not typically involved, public/private, other	Agreed. This is the overall approach of the Partnership.
Adaptive management can be used to effectively determine where to spend money in the face of uncertainty	Agreed. Adaptive management is being addressed by the Partnership under a separate effort.
Precautionary principle should be used to address lack of certainty/data	The comment provides opinion. Criteria identified in P2 include use of science as a basis for understanding and solving problems.

Plans / Programs / Regulatory

Comment	Response
Regional Summary of various water plans should be created in first step towards crafting a regional plan.	The comment has already been addressed in the paper (see Sections S1 and P2).
Management approaches should focus on better implementation of existing regulations first, before creating new regulations	This has been identified as a criteria for prioritizing actions (see P2).
Need a strict phase-out / monitoring of septic systems near Puget Sound / Hood Canal	This comment should be addressed in the Water Quality Topic Forum discussion paper.
Cruise ships should not be allowed to discharge to surface waters while at dock. The 2007 State of the Sound report recommended that greater attention be paid to vessel discharges, noting “The increase in cruise ship and recreational boat traffic may lead to establishing no-discharge zones.”	This comment should be addressed in the Water Quality Topic Forum discussion paper..

Capital / Infrastructure

Comment	Response
How will infrastructure need to be expanded retrofitted to meet perceived demands: needs to be addressed	This comment has not been incorporated into the revised Topic Forum discussion paper at this time. The comment addresses a level of detail that is beyond the scope of the topic forum discussion draft.

Science Needs

Comment	Response
Water Quantity issues at the regional / local scales needs to be understood and integrated.	This comment has been incorporated into the revised Topic Forum discussion paper (P1 and P2).
Information is available (USGS) for a regional water balance discussion. Data needs to be accessible.	This information has been incorporated into the revised Topic Forum discussion paper in Section S1.

Comment	Response
Need to place greater emphasis on the need for more accurate modeling of projected water needs from both an integrated ecological / human perspective	This comment has not been incorporated into the revised Topic Forum discussion paper at this time. The comment addresses a level of detail that is beyond the scope of the topic forum discussion draft.
Regional metering is needed - require meters on all wells and surface water systems to document withdrawal, leakage and use	P2 suggests an initial strategy of requiring metering and reporting for 80 percent of water use by volume. This is a first step in the process to set a realistic goal for metering.
Regional database of water quantity information is needed	The paper recommends a regional compilation of water quantity information. Refer to other parts of the Puget Sound Partnership process for future work on monitoring and data collection and reporting.
Need to be able to project future scenarios A regionally specific prioritized approach to instream flow monitoring needs to be established.	Agreed. This comment presents information that is related to the Partnership’s objectives for the water quantity topic, but can not be fully evaluated during the first phase of the Action Agenda. The water quantity topic forum recommends that the Partnership consider evaluating these suggestions in future phases of the Action Agenda.

Conservation Tools / Strategies

Comment	Response
<p>Conservation as a tool for managing demand:</p> <ul style="list-style-type: none"> Water efficiency is an important tool in freshwater resource management. It has a very high regional potential, and unlike many other management tools, it can be quickly implemented at a cost competitive with other options. Additionally, opportunities for water efficiency, energy conservation, and initiatives to help address climate change are just being linked together. This is an area the PSP may want to explore further. 	The discussion on conservation and water efficiencies has been expanded in the revised Topic Forum discussion paper (sections S2 and P1).

Comment	Response
<ul style="list-style-type: none"> • Conservation provides a very successful and cost-effective approach to reducing demand in the region. Seattle has been very successful with its programs. Incentives and removal of barriers to implementing programs will make those same programs more accessible to other utilities and municipalities. Conservation should be first before creating “new water”, including reclaimed water and desalination, which come with high price tags. We provide more specific comments on conservation and water efficiency later in this document. 	

Preservation Tools / Strategies

Comment	Response
Keeping water in the watershed: <ul style="list-style-type: none"> • Solutions involving preservation and restoration of wetlands, forest duff, and other areas that retain stormwater should be added to water management strategies. 	This comment has been incorporated into the revised Topic Forum discussion paper.

LID Tools / Strategies

Comment	Response
Flow Credits: <ul style="list-style-type: none"> • Encourage review of existing monitoring projects to evaluate flow credits for low impact development techniques, especially for pervious pavement and bioretention. • "Fair" flow credits are needed. As flow credits become fairer, it is our opinion LID implementation will become the stormwater mitigation strategy of choice where LID use is appropriate. 	This comment has been incorporated into the revised Topic Forum discussion paper (S2). This comment is addressed in the land use and water quality topic discussion papers.

Comment	Response
<p>Education:</p> <ul style="list-style-type: none"> • Encourage and support additional technical training on how to design, install, maintain as well as review and approve low impact development practices. • Continuing education for the public, private sector, land owners, public and private sector engineers are all important so that all understand exactly what low impact development is and is not. • The education should also teach to utilize these techniques in project design and construction – as well as how project that utilize LID techniques are reviewed and approved. 	<p>Issues relating to education/outreach are being addressed through other efforts being conducted by the Partnership. Outcomes from these efforts will be integrated with the findings from the topic forums in development of the Action Agenda.</p>
<p>Rainwater Harvesting:</p> <ul style="list-style-type: none"> • Rainwater Harvesting is a potentially significant low impact development technique that is severely limited in usage due to Surface Water Rights issues. • DOE currently allows rainwater harvesting without a surface water right permit for de minimus uses (i.e. for one single family home). • Surface Water Right permitting is lengthy, expensive and difficult to obtain for larger projects. There should be a simpler, less expensive and more timely Surface Water Right permit when rainwater harvesting is used on larger projects. • When an annual water budget that shows how all the collected stormwater will be used during that year, the roof area is no longer considered impervious. Uses for rainwater collection include; irrigation, grey water uses and when approved by the local health district even for potable 	<p>This comment has been incorporated into the revised Topic Forum discussion paper in Section P1. Issues relating to broad institutional barriers are being addressed through other efforts being conducted by the Partnership. Outcomes from these efforts will be integrated with the findings from the topic forums in development of the Action Agenda.</p>

Comment	Response
<p>Maintenance:</p> <ul style="list-style-type: none">• Maintenance is an important issue with low impact development techniques.• Maintenance often raises questions of how to insure that LID installations will continue to perform in the future. While more research is warranted, LID maintenance requirements (especially for bioretention cells and pervious pavement) are simple and relatively inexpensive. In the initial LID implementation stages the concern will be greater than once regulators have a period of time to actually monitor the effectiveness of different maintenance practices. While an important issue, education and practical applications will provide greater understanding and insight	<p>This comment is addressed in the land use and water quality topic discussion papers.</p>

Document Specific Comments

The following comments were received providing detailed comments on the topic forum discussion paper. Many of these comments have been summarized in the comment summary, others provide suggested editorial changes. These detailed comments were reviewed and incorporated into the document as deemed appropriate by the paper authors. Specific responses are not provided below.

S1:

S1 A. Changes in Watershed Hydrology.

- In discussing freshwater hydrology, it is essential to maintain clarity between regulated and unregulated rivers and between mainstem and tributary streams.
- It is essential to consider not just flow and flow variability, but also the condition of the channel and floodplain in which flows occur. The character and distribution of sediments, riparian vegetation, and floodplain connectivity all interact with flows to result in channel formation and conditions experienced by fish.
- The third bullet is an appealing image but the assertion needs reference to the professional literature.

S1 A. Status of Freshwater Quantity in the Puget Sound Region

Where in the Puget Sound region are the amount, timing and distribution of freshwater flows adequate? Where are they impaired? This baseline information is important to determining what actions need to be taken.

S1 A.

The amount of fresh water entering Puget Sound in June through September has decreased by 18 percent between 1948 and 2003. This likely represents changes due to warming, land use, and regulation of flows. (Snover, et al., 2005).

Do we know if: 1) return flows are not included in the 18%; 2) the precipitation has decreased by a similar amount; or 3) if the evaporation has increased sufficiently to account for the decrease?

Section S1 A., Freshwater Inflows to Puget Sound, first bulleted statement

“There are two major periods of runoff into Puget Sound: Peak flows occur in December and June (U.S. Department of Commerce, 2007)”

While this statement may be reasonably accurate for Puget Sound as a whole, it may be useful to look in more detail at variations in peak flow timing across different sub-regions. If so, please note that significant numbers of peak flow events have been recorded in low elevation river basins in mid-Puget Sound, such as the Cedar River and Green River basins, between November and February. Please see:

(http://nwis.waterdata.usgs.gov/wa/nwis/peak?site_no=12117500&agency_cd=USGS&format=html)

(http://nwis.waterdata.usgs.gov/wa/nwis/peak?site_no=12113000&agency_cd=USGS&format=html)

S1 A. Changes in Watershed Hydrology, third bulleted statement

“...that require higher flows (than typical) to make them favorable during low-flow periods.”

This statement would seem reasonable for systems that have not been confined and narrowed by artificial levees and other forms of bank hardening and/or unusually high rates of channel incision. Might one expect that, in such artificially altered systems, elevated flows during the low flow season may not result in improved conditions and may in fact result in more uniform conditions with water depths and velocities that exceed optimal ranges for small fish?

S1 A. In the bulleted list of major factors influencing Puget Sound through fresh water inflow, the fourth bullet is misleading. Tidal exchange volume far exceeds freshwater inflow. This, coupled with Puget Sound bathymetry of basins and sills, more strongly influences “subtidal circulation”. Freshwater inflow strongly influences surface salinities and of course estuarine circulation.

S1 A. Changes in Watershed Hydrology fourth bulleted statement

“Full ecosystem function must be considered to determine whether flow is adequate to protect habitat function. Naturally varying high flows as well as minimum low flows are important. Over the evolutionary history of Puget Sounds’ native aquatic species, naturally varying flow conditions have played an important role in the adaptation of those species to local river and stream systems and habitats. When flow conditions fall outside the range of historic natural variation, the viability of native species adapted to that local variation in flow can be affected. (Spence, et al., 1996; Naiman et al., 1992, 2008)”

While we concur with this general statement, it is perhaps also important to consider the rates at which environmental conditions change and the capacity of various native species to adapt to changes in their environments. For example, salmonid species adapted to and flourished during large geologic and climatic changes that occurred relatively slowly since the last Ice Age. However, these species have clearly been challenged by much more rapid rates of change associated with natural resource extraction, development, and urbanization that occurred during the last 100 years.

In addition, it is perhaps increasingly important to consider, not only the magnitude, duration and frequency of varying stream flows, but also the altered nature of stream channels that receive these flows. The channels of many Puget Sound streams have been substantially straightened and confined with levees and other forms of bank hardening. In addition, inputs of coarse sediment have been altered and the frequency and delivery

of large woody debris has been greatly reduced in many systems. In these altered channels, it would seem prudent to improve our understanding of the specific interactions between stream flow and the geomorphic processes influencing the formation and maintenance of important habitat features. S1, p. 4 “Future Demand for Fresh Water” assumes same levels of per capita conservation in the future as exists today. That’s understandable but per capita consumption will likely drop.

While there is not a regional demand forecast, there is a demand forecast for the three county areas, which makes up the majority of the population in Puget Sound. This forecast was completed by the CPS Water Suppliers’ Forum in 2001 and is included in a document called The Outlook. The Outlook is being updated this year. This paper should note this work and acknowledge that it could help address some of the information gaps in this region. It would be informative to determine what portion of the anticipated population increase of 1.4 million will be included in the Forum’s updated demand forecast.

S1 B. Data Gaps and Uncertainties – 2nd bullet.

There is no regional assessment of the adequacy of flow variations for optimum habitat function, although some newer operational permits for FERC licenses and HCPs are considering high- and low-flow release prescriptions (Cushman Hydroelectric Project, Seattle Public Utilities Cedar River HCP).

Please refer to the comment below regarding our HCP. The Cedar River HCP includes (past considering) the “high- and lo-flow release prescriptions” that are considered beneficial. This reality might obviate the assertions that ‘stream flows are problematic for instream resources in the Cedar River.’

S1 B. Adequacy of supply - It is important to acknowledge that streams would have experienced a range of low flow conditions before development. Thus, “adequacy” must always be considered a relative term, and its evaluation depends on a variety of habitat factors and population parameters.

S1 C. Data Gaps and Uncertainties- Water system plans are numerous and not regionally compiled. If they were, what would we gain? More important is the quality of the content of those plans as they relate to utility impact on Puget Sound resources, and coordination of those plans with land use agencies.

S1.C. Data Gaps and Uncertainties- Regional water supply planning is not occurring everywhere. The work that is being done by the Central Puget Sound Water Suppliers Forum (CPSWSF) is describing the supply and demand situation in central Puget Sound. Unlike the local water system plans, it will not be laying out a strategy for meeting demands in the future. Water systems are not like electricity in that you can’t easily move water around. There are significant infrastructure and water quality issues that make this a bigger and more costly challenge. So supply and demand issues tend to be more local. Regional solutions come from utilities coordinating with one another. But it is essential to understand the local conditions in order to do that. Having a body like the CPSWSF provides that forum for looking at the regional view in central Puget Sound

where proximity to other systems is very good. Coordination among utilities is more important than doing more planning. That being said, this may vary in different parts of the Sound. It may make no sense in parts of the Sound where water systems are more spread apart and have fewer opportunities to coordinate. This data gap assumes that regional water supply planning is a good thing throughout the Sound.

S1 D. Climate Change Data- Just as a matter of point, the Climate Impacts Group predicted climate change impacts on regional hydrology. The local utilities forecasted the demand and examined water supply alternatives. Further in this section, it would be more representative to give ranges for different basins than use the ensemble average across basins. It is misleading to characterize the information we have on climate change as applicable across basins and precise enough to come up with exact numbers. Different GCM's produce different results that are not fairly simplified into an ensemble average. This can lead to an overstatement of the problem and mislead decision-makers into believing that regional action can be based on this information.

S1 D. “Climate Change Data”. We are not aware that UW CIG had done regional demand forecasts. Also, this paragraph notes ensemble averages for discharges across basins. It would be better to refer to ranges across basins.

S1 F. A big gap in our knowledge is a full understanding of the hydrologic impacts of climate change, particularly how climate change may alter rainfall patterns in the NW.

S1 G. Data that indicate groundwater levels, trends, and depletion on a regional scale. Again, what is the value of collecting this information? How is it going to be used in creating solutions. We need to avoid collecting information that is not put to use.

S1 G. Gaps in understanding - Suggest adding bullet: Fuller understanding of the ecological impact of flow alteration, in addition to instream conditions and fish populations: i.e. riparian vegetation, instream primary production, invertebrates, herpetiles, and birds.

Table S1-1, second row, last column:

“summer/fall baseflows in all AND spring flows and fall freshets in Cedar River”

We are unclear about the technical basis for asserting that stream flows during these periods are problematic for instream resources in the Cedar River and we hope these assertions do not refer to Seattle's current instream flow management practices on the Cedar River. Seattle's Cedar River instream flow management practices during all times of the year, including the spring, summer and fall, are governed by the provisions of the *Cedar River Watershed Habitat Conservation Plan* (HCP) and companion agreement, the *Instream Flow Agreement for the Cedar River* (IFA) as approved by the National Marine Fisheries Service, United States Fish and Wildlife Service, Governor of Washington, Washington Department of Fish and Wildlife and Washington Department of Ecology in April of 2000. The 2006 Settlement Agreement between the Muckleshoot Tribe and City of Seattle (MIT/Seattle Settlement Agreement) incorporates these same flow management provisions, extends the term of the provisions beyond the 50-year period

established by the HCP, and further limits Seattle's maximum allowable annual diversions beyond those limits established by the HCP. Detailed discussions of the biological basis for the guaranteed flow regime prescribed as part of the IFA are described in sections 4.4.2 and 4.4.4 and 4.6.4 of the HCP. A summary of relevant aspects of these discussions is provided below.

The HCP guaranteed flows during the spring months are well above the levels required to provide Maximum Weighted Usable Area for juvenile Chinook salmon, coho salmon and steelhead trout as determined by collaborative Physical Habitat Simulation (PHABSIM) analyses. In addition, Seattle works closely with the interagency Cedar River Instream Flow Commission (IFC), established by the HCP, to allocate discretionary water (over and above guaranteed minimums) to meet four additional objectives during the spring, including:

- Refilling the winter flood pocket in Chester Morse Reservoir to ensure sufficient water storage for instream resources and municipal water supply during the summer and fall
- Elevated stream flows during early spring to support beneficial instream conditions for emigrating juvenile sockeye
- Moderated stream flows during late spring to provide high quality habitat for spawning steelhead in locations that minimize the risk of subsequent redd dewatering during the summer incubation period
- Reserving sufficient flood storage capacity in Chester Morse Reservoir to help reduce the risk of large peak flows that may scour salmon and steelhead redds.

During the summer months, the HCP guaranteed flows are also near or above the levels providing Maximum Weighted Usable Area for juvenile Chinook, coho and steelhead. As during all other times of the year, Seattle works with the IFC to allocate discretionary water, when available, for additional benefits to instream resources during the summer including enhanced dewatering protection for steelhead redds and augmented base flows during the lowest flow period of the year.

P1:

P1 A - Water Conservation Programs

Conservation programs vary widely within the Puget Sound region. The City of Seattle employs an effective conservation program that could be used as a model in other areas. Ambitious conservation programs have been shown to be effective in reducing per capita water use. There is little consistency in goals for water use efficiency over the Puget Sound region. Starting in 2008, provisions in the 2003 Municipal Water Law will require larger water systems to provide water use efficiency plans (WDOH, 2008). However, the goals will vary by water system, and the rule does not include specific targets for efficiencies.

General comment: Facts on actual freshwater use in the region, including long term trends and forecasts, should be presented. General statements about increased population and per capita per day use are used as illustrations of a potential threat. The magnitude of

existing use and the extent of impacts of future use should be presented. Per capita and total water use in many of the major water systems in the region have been declining over the past decade, and the continuing trend in this decline suggests more analysis is needed for accurate projections.

The state and the regional governments have created many barriers to water efficiency, mostly unintentional. At the same time, governmental incentives to encourage water efficiency are still rather rare. Among the state barriers to efficiency is a use-it or lose-it water right system, state tax and other revenue weighted toward increased water sales, and lack of a statewide water efficiency plan and goal. Attempts to remove legal barriers to the more efficient use of rainwater and storm water have had limited success in the legislature. State incentives are largely lacking for financial and technical assistance to major water users. Water conservation incentives are also lacking from the State's Utilities and Transportation Commission, who regulates private water systems in the state, yet they have granted incentives to energy utilities for energy conservation.

While new development will benefit by having fixtures and plumbing code that drive more efficient use of water, there needs to be a broader regional embrace of conservation that will also decrease per capita consumption through a programmatic approach.

Large public water utilities have state approved long term system plans. They are including conservation as part of their long term planning process. Elected officials of each public water system are required to hold a public meeting before setting a water efficiency goal for their system. This approach provides a higher level of accountability and flexibility for utilities to set cost effective and environmentally sensitive goals, as opposed to a one size fits all state mandated minimum goals. In stark contrast to public water utilities, the largest water uses in the State, agricultural and industrial self supplied, have no state water efficiency requirements. Sadly, they also have many barriers to water efficiency, and very few incentives.

P1 A. Threat and existing policy.

- Last bullet, add “and floodplains”.
- With respect to Instream Flow rules, there is a need for evaluation of the effectiveness of rule implementation in limiting new water rights and in curtailing use when indicated by low flow or drought conditions.

P1 B.

- Desalinization. Energy efficiency and impacts should be mentioned in any discussion of desalinization technology.
- Stormwater infrastructure and design should be explicitly addressed in this topic area as well as in land use or water quality.

P1 B. (p. 28) Minor point, but under Water Conservation programs, change City of Seattle to Seattle Public Utilities. Also add “multi-sector, multi-faceted” after “employs”

P1 C. (p. 30) Under “C”, last bullet, need to make sure that whenever there is discussion about use of reclaimed water that they also refer to using rainwater and greywater. Rainwater harvesting also has the additional benefit of potentially adding useable detention storage, which could be a benefit for drainage control purposes during the wet season. I believe the State’s Water Resources Preparation & Adaptation Working Group took this approach.

P1 D. - Gaps in Specific Programs Gaps we have observed in existing programs are summarized as follows:

•Current conservation programs appear inadequate to address peak season use or to initiate social change in water use patterns throughout the entire region, although there are some locally successful programs. This is evidenced by per capita water use data for some utilities and the relatively small percentage of reclaimed water use, region-wide. To address the combined threats of population growth and climate change impacts to streamflow during low-flow periods, per capita consumption of water will need to be reduced in the future. There is no current program focused on social behaviors to address the combined impacts of these threats region-wide.

Unfortunately many state and local barriers exist that restrict water efficiency. At the same time, few incentives exist to help maximize benefits and promote water efficiency. Disincentives abound. The recommendations from a state appointed joint task force on water use efficiency, along with proposed legislation, have largely not been adopted.

Some of the strongest drivers for water efficiency include strong user economics, a well developed public conservation ethic, and risk reduction for an uncertain climate future. Many local examples of water efficiency successes are readily available. These could provide a firm foundation for projecting a larger regional “conservation” potential and help to quantify the benefits. The good news is that efforts to do this are already underway as a regional utility forum.

•Reclaimed water programs have been slow to take hold due to public acceptance and perceptions, as well as regulatory hurdles. These barriers to reclaimed water use are addressed by the Water Quality Topic Forum.

The “relatively small percentage of reclaimed water use” reflects that there are not environmental drivers laying out a case for reclaimed water and that, so far, most reclaimed water projects are not cost effective. Reclaimed water programs have been less hampered by a lack of public acceptance, perceptions and regulatory hurdles, but rather the cost for such programs exceed benefits. Returning to the topic of conservation, there should be greater efforts around conservation before focusing our attention on reclaimed water. Initiatives to ramp up use of rainwater, stormwater and reclaimed water should be at the very least accompanied by a dramatic increase in conservation, and more likely should follow that dramatic increase.

Another related issue not mentioned in the paper is the role of decentralized reclaimed water, which should be the focus, rather than centralized facilities. This issue is implicit

in discussions about pumping reclaimed water back up to headwaters or mid-basin. This is very inefficient from an energy perspective.

Table P1-1.

The entry for FERC could be expanded or split into two. Additional tools included mandatory conditioning authority of federal agencies with a nexus to the project and opportunities for third party intervenors to participate in the licensing process.

The entry for Stormwater should include municipal stormwater permit holders as managing agencies and should expand on the ability of permit provisions to address both the rate of flow and stormwater pollutant loading.

S2:

S2.A. Demand Strategies- The report indicates that “The Water Quality Topic Forum is addressing reuse alternatives and documented effectiveness of this demand strategy.” I was unable to see that documentation in the water quality report.

S2 A. Solution (Conservation): Help reduce threats of population growth on freshwater resources. Demand strategies: focus on reducing or maintaining consumptive uses of water.

S2 A. Solution example: Seattle Public Utilities (SPU) employs a conservation program that has been effective in reducing per capita water use by 1 percent per person per year. SPU has reported that their “1 percent per person per year by 2010” conservation goal has resulted in an average summer use per typical three-person family of 240 gallons of water per day (80 GPCD) (SPU, 2005). Seattle’s summer usage of 80 GPCD is significantly less than the statewide annual average usage of 97 GPCD reported by Lane (2004).

S2 A. Demand Strategies should include prices/rates. Also, rainwater and greywater should be mentioned whenever reclaimed water is mentioned. Include mention of the Saving Water Partnership to highlight a sub-regional group that is helping to deliver on conservation savings for the region.

S2 A. Where you talk about SPU’s conservation program you could add some additional context regarding historic savings to highlight the dramatic reductions in per capita water use and the additional population served while holding demand constant. This could help highlight what can be done. In addition, SPU and its customers have committed to achieve an additional 15 mgd of conservation by 2030.

S2 A. *Seattle Public Utilities (SPU) employs a conservation program that has been effective in reducing per capita water use by 1 percent per person per year. SPU has reported that their “1 percent per person per year by 2010” conservation goal has resulted in an average summer use per typical three-person family of 240 gallons of water per day (80 GPCD) (SPU, 2005). Seattle’s summer usage of 80 GPCD is significantly less than the statewide annual average usage of 97 GPCD reported by Lane (2004).*

SPU's conservation program has reduced per capita water use approximately 38% since 1984 from 165 gpcd to 100 gpcd while at the same time population has increased by 18% from 1.04 million to 2.8 million. The result is that actual annual demand has decreased since 1984 and is forecast to remain flat or continue to decline for the next 20 plus years.

S2 A. Dam Operation Strategies, Hydropower FERC. A useful citation for the Skagit River project is

Edward J. Connor and David E Pflug
Changes in the Distribution and Density of Pink, Chum, and Chinook Salmon Spawning in the Upper Skagit and Chinook Salmon Spawning in the Upper Skagit River in Response to Flow Management Measures. (North American Journal of Fisheries Management)

S2 A. first paragraph of “Tribal Negotiations”

The negotiations described in this paragraph are more correctly described as follows. The City of Seattle, National Marine Fisheries Service, U.S. Fish and Wildlife Service, Governor of Washington, Washington Department of Fish and Wildlife and the Washington Department of Ecology signed the Cedar River Municipal Watershed Habitat Conservation Plan (HCP) and companion Instream Flow Agreement for the Cedar River (IFA) on April 9, 2000 after more than 6 years of active discussion, negotiation and development. Although Muckleshoot Tribal representatives took part in many of the discussions, the Tribe did not sign the agreements and, in late December of 2003, filed suit challenging the agreements and the issuance of an Incidental Take Permit under section 10 of the federal Endangered Species Act.

Subsequent discussions between Seattle and the Tribe resulted in the 2006 Settlement Agreement between the Muckleshoot Tribe and City of Seattle (MIT/Seattle Settlement Agreement) in 2006. This agreement incorporates by reference the provisions of the HCP, including the IFA and all provisions related to the management of stream flows (Section B.1.3 of the MIT/Seattle Settlement Agreement). In addition, the MIT/Seattle Settlement Agreement further restricts Seattle's annual diversions from the Cedar River beyond the limits established by the HCP (Sections B.1.1 and B.2), thereby expanding flexibility for and reaffirming collaborative management of discretionary water, when such water is available (Section B.1.2).

S2 C. Effectiveness - It should be acknowledged that the IHA method and software depends on a record of daily flow statistics of adequate accuracy and duration, typically USGS gauge data. Such data sets are available for only a small cross section of Puget Sound streams. By the same token, understanding and use of hydrologic modeling continues to advance and can be an important tool in evaluating effectiveness of management techniques.

S2 D. The science question is ‘*which approaches are known to have the most effective results for managing water resources for habitat? For municipal, domestic, agricultural, and industrial uses?*’

The answer is provided that:

In summary, management approaches that have some level of documented effectiveness in protecting and/or restoring freshwater supply for both instream and out-of-stream purposes include:

- *Coordinated demand management,*
- *Dam operation strategies that provide more optimal flow conditions,*
- *Instream flow rules that include provisions for future water reservations and basin closures, and*
- *Adequate effectiveness monitoring and adaptive management.*

SPU is currently employing each of these management approaches for Seattle regional water supply and its activities are used as examples for each of the management approaches. SPU fully acknowledges that improvements can and should be made to its approach to management of the rivers and reservoirs as evidenced by the current adaptive management analysis underway as a part of the HCP for the Cedar River. However, the reference to the Cedar River and by extension the Tolt River in Table S1-1 as “poor” High Flows and “poor” Low Flow does not seem to be supported by the evidence. Since, SPU is employing all of the management approaches that have some level of documented effectiveness in protecting or restoring freshwater supply and has been successful at these approaches, the conclusion would follow that the rivers managed as a part of the SPU regional system are protected or in the process of restoration.

P2:

P2 C. 2a- Conduct a regionally consistent assessment of water use and future water needs, and availability. It is not exactly sure what this means, nor is the value of such action clear. This holds true for both surface water and ground water.

P2 C. 3b - Use the assessments of climate change to estimate regional and local impacts on water supply, water demand, floods, groundwater, and the ability to meet instream flow requirements and fish targets.- There are several problems with this. The most important is that it ignores that, at least for the 3 major utilities in the Puget Sound region and maybe others, water supply estimates are determined on meeting instream flows. This statement doesn't reflect that there are already limitations on water supply from water rights and agreements on meeting instream flows. Another problem with this is that there is not good enough data from the CIG work to assess climate change impact on floods and groundwater. For example, the intensity of rain events is not captured which is critical to assessing impact on floods.

P2 C. 5d. Develop water supply management plans - I think we need to find a way to coordinate rather than create more plans. It would probably take a few years to create a regional management plan and not necessarily succeed in getting the parties to agree on much in the process. There needs to be a set of goals and objectives to achieve to let utilities work it out.

P2 C 6a- Develop a process to integrate land use planning, watershed planning, water quality planning, utility planning, and ESA recovery planning. This is probably one of the most important proposed actions. However, the scope of this is huge and needs to be narrowed in terms of the goals and objectives, and targeted to create a clear benchmark for success. Otherwise we'll be in an endless planning process that ends up with no real solutions. A model process that starts with objectives and goals, can be used by local areas. Land use planning tends to be left out of the equation in water resources and is essential to be a significant aspect of any water resource planning.

P2 A2 Criteria and Benchmarks The value of regional reporting and compilation of water use data is questionable. What is the purpose of this effort and how is the data going to be used to benefit Puget Sound?

P2 A2 Benchmarks. 2. Develop goals for percent of non-potable water demand provided by reclaimed water. This sounds like a pre-cursor to requiring reclaimed water, and assumes that the best approach to reducing use of drinking water supply for non-potable purposes is reclaimed water. More could be saved through a conservation program or price incentive, and more cheaply. With this in mind, it is more practical to set a goal for reduction of demands, which takes into account reduction of non-potable water demands. Then, appropriate, cost-effective local solutions can be applied. We should all be stewards of public money as well as stewards of water resources. We should not be spending money where we cannot produce commensurate results.

P2 A (Pg 45). Making Progress – Outcomes and Benchmarks

2. Identify water needs or goals for people by watershed (WRIA) and promote demand management.

- *Compile a regional summary (Puget Sound basin wide) of current water use (all sectors), projected water use, and water supply (consider climate change impacts).*
- *Develop goals for percent of non-potable water demand provided by reclaimed water.*
- *Establish conservation targets – e.g., Puget Sound per capita water use factor.*
- *Establish purveyor conservation targets.*
- *Identify a target number of ASR and desalinization projects and equivalent streamflow savings.*
- *Determine the percent of water system plans that have adequate water supply to meet the 2020 threshold (projecting adequate supply through 2020).*

The goal of establishing a percent of non-potable water demand to be supplied by reclaimed water is unsubstantiated. The first priority in any water planning is to make our overall water use as efficient as possible – demand management. A second element of this analysis may be to ask the question – does a particular use of the water supply need to continue. At some point in the future as has happened in the past, public policy may decide that certain water uses may not be necessary. One example may be the irrigation of play fields – the natural turf may be replaced with artificial turf, eliminating the need for irrigation.

P2 C. 2b (p. 42) Discussions about sustainable water use should include rainwater & greywater. The bullet regarding “develop rules” should read, “develop rules for rainwater and greywater use and water reclamation that promote water conservation.” In addressing the issue of financial support (in the last bullet), then again, it should be extended to rainwater and greywater. Also, add a bullet that calls for “identifying and addressing barriers to the use of rainwater, greywater and reclaimed water.”

P2 C. 3b (p. 43) The assessment of the impacts of climate change on water supply should be done by the suppliers themselves, to the degree they have the capability to do so. This might be a good place to note that Seattle, Everett and Tacoma have all assessing their own supplies and presented this information to various audiences.

P2 C. 5c (p. 44) Adjudication seems like a very, very long term action and expensive and distracting as well. Question if this is an issue PSP wants to tackle.

P2 C. 5d We question the value of a three county water management plan, particularly when the Outlook Update is already a good tool providing coordinated information.

Update the citation of the State Salmon Recovery Act from 2496 to RCW 77.85.

Science Question 1

1. The concept of flood control seems to be omitted from this paper. Flood control via levees increases velocity, narrows channels, and reduces floodplain connectedness. Flood control via dams shaves peak flows and decreases floodplain connectivity. It is surprising that it is not even mentioned as a data gap in this status paper. How much of each river is channelized? How have flood events changed from historic times?
2. King County’s regional water supply planning process should be highlighted in section C, but it is not referenced. This work covers water demand for a large fraction of current and future population in the Puget Sound region.
3. Add greater emphasis to water demand for agriculture in this section. If it hasn’t been compiled, then it is a major data gap.
4. Table S1-1. Vashon-Maury Island is in South-Central Puget Sound Action Area, and also in WRIA 15. There is a 2514 plan for Vashon-Maury Island that is not quite “official” but that is being implemented, unlike the 2514 plan for Kitsap that was shelved. A line should be added for this under South-Central action area.

Table S1-1: Note that WRIAs 8 and 9 both have altered hydrology. The natural outflow for the Cedar River was the Black River that in turn flowed into the Green River. Now the Cedar River has been moved to flow into Lake Washington. In

addition, a ship canal and locks now connect the fresh water of Lake Washington to the salt water of Puget Sound, but there is no natural estuary. The Duwamish River that flows from the Green River was dredged and straightened into the Duwamish Waterway. The severely altered hydrology of these two watersheds impacts the determination of normative flows.

Table S1-1: Please add WRIAs 7 and 10 in the column titled King County Regional Water Planning. While the Tributary Streamflow Technical Committee addressed only WRIAs 8 and 9, the Climate Change Technical Committee covered WRIAs 7, 8, 9, and 10.

Studies not mentioned: basin assessments by Ecology in mid-‘90s; KC watershed assessments for Norm Flow Project; groundwater study for Auburn water rights applications; Soos Creek/Middle Green by WRIA 9; Samm River Corridor; Stilly EDT by Shared Strategy; exempt well data in Small Systems report; evaluation by TRT of water information in PS ESU watershed plans

Science Question 2

5. Only a few of the many different management approaches are discussed, but basically this section says that we don’t know how effective any of them are. For example, LID is not discussed as a flow management approach, but it definitely is. Use of reclaimed water is not discussed as an approach, but it definitely is.

6. In section C and D, there are two different kinds of effectiveness monitoring that we are talking about. First, how effective is each approach. This would require data on small scales about how different approaches can result in different flows. These data can then be extrapolated to calculate total impact across Puget Sound. Second, data for river and stream flows need to be measured and analyzed to see how the flows are changing over time. This way we can assess if they are getting “better” or “worse” over time.

Ecology needs to provide an assessment of the value of instream flow setting by consensus in basins that are likely already over-appropriated. They also need to explain whether their rulemaking criteria conform to the salmon recovery objectives of the ESA, and how they know that. In other words, simply stating that a key element of the region’s strategy is setting instream flows where none currently exist does not explain why the state’s investment in this activity should be a priority, and what Ecology expects to gain from it.

The Demand Strategies section needs to mention the Water Use Efficiency rule under the Municipal Water Law, and how we will know what is working when utility annual performance reports start being sent to WA Department of Health in July 2008.

Discussion of dam operation should mention negotiations with the Army Corps on Green River for instream flows, and the Corps’ unilateral change in operations on Mud Mountain to reduce peak flows, which may change habitat forming processes.

Policy Question 1

7. Add levees and flood control to this section. The use of levees is a flow management policy to protect property and human safety in floodplains. However, there is a trade-off on flow and habitat that is worth noting.

Lots of minor inaccuracies in this chapter -- for example, Ecology was authorized to establish minimum flows with water rights before 1987.

Lots of statements re 'effective' existing strategies, but no definition or documentation.

Most of the 'adequacy' discussion points out the failure by state agencies to do their jobs.

Policy Question 2

8. Rename section B from “What strategies are and are not working?” to “What strategies are improving freshwater flows and what strategies are not?” The reason for this is that there are some strategies that are very successful (such as old-fashioned stormwater conveyance in areas with lots of till preventing localized drainage issues, or levees preventing flooding but increasing water velocity and scouring) but do not improve freshwater flows.

9. Under strategy 1, we would recommend adding an action about implementing LID, or encouraging discharge to groundwater, of stormwater to the maximum extent possible.

10. Under strategy 1, add an action to encourage the setting back of levees from rivers to allow for more flow complexity and interaction between river channels and the floodplains.

11. Under strategy 1, add an action to encourage “unplumbing” of the water/wastewater system, to have highly treated wastewater discharged back into the basin from which the water originated, as opposed to being discharged directly into Puget Sound.

12. Under strategy 2b and 2c, minimizing human uses of water to the extent practicable (conservation) is probably one of the most important things we can do in the next 12 years. These two items don't really state that as the objective.

13. Two main goals are to maximize water use efficiency, and restore natural hydrologic functions High flows. The paper does not discuss high flows to a sufficient degree. As this topic paper is integrated with land-use and species/biodiversity topics, the role of high flows in sustaining ecosystem processes should be given a fuller treatment. This of course also relates to flood risk and the role of flood protection systems in exacerbating some of the problems associated with floods. Also, see comment above regarding forests and

forestry. Use cubic-feet-per-second (cfs) to link other rates to biologically meaningful rates. The paper tends to use “millions of gallons per day” (mgd) as the unit of choice for discussing demand in particular. It would be very useful to either provide a conversion table or simply the cfs equivalent in parentheses, and vice versa. For example, the projected need of an additional 136 mgd to serve the growing population in 2020 translates to 210 cfs, a value that can be readily compared to the flows in key watersheds (e.g., the lowest monthly mean flow in the Tolt River is only 179 cfs in the month of August).

S1.A. Changes in Watershed Hydrology, 3rd bullet (no page numbers provided in portions of document). Explain/clarify the statement “This results in channel conditions that are less favorable to native flora and fauna most of the year, and that require higher flows (than typical) to make them favorable during low flow periods.”

S1.B. Data gaps. The paper mentions the work by Seiler to quantify the effects of scouring flows on smolt production (actually egg-to-fry survival). This is an important area of further study, but unfortunately this work has been frequently cited as applicable in seemingly all locations where salmon spawn, which may not be the case in areas where hydrology and channel form are in near-natural condition. Moreover, the study is often erroneously generalized to apply to basically any high flows during incubation. Seiler’s work focused on the correlation between the single highest flow event and subsequent survival, as inferred from subsequent smolt estimates and adult returns. This is very different from other measures of high flow, such as mean flow during the winter season.

S2.A. Flow setting strategies. Define “DRIFT”.

S2.A. Demand strategies. The paper lacks discussion of fee structure and incentives as a tool for reducing demand. An ‘impact fee’ on water use could be an effective tool for reducing demand while also providing a funding source to be directed at restoring habitat and other watershed conditions affected by hydrologic alteration. Currently, water use charges only account for conveyance, treatment, system maintenance etc., but not the impacts of the withdrawal. While the paper is not meant to provide explicit solutions, a discussion of current fee structure and potential options would be appropriate in the Strategy section.

S2.A. Dam operation strategies. See comment above re FERC relicensing. This section claims that reduced PSE withdrawals were a “primary factor” in significant increases in spring Chinook. The provided citation is simply a list of spreadsheets with fish-count information. Has the correlation and/or causation of flows to fish been measured statistically?

p.32. Enforcement. Expand on why enforcement is ineffective. Lack of funding?

p. 43. Strategy 4a. While plans for enforcement and compliance may be appropriately developed on the watershed scale, the State must take responsibility for defining plan

requirements and for performing the enforcement function. If left to local level, enforcement will be unevenly applied and politically difficult locally.

p. 43. Strategy 4c. Please explain this 80% metering and reporting requirement. Is this meant to include exempt wells? It would be useful, for instance, for readers to know that the 80% figure is met in WRIA 8 by the metering of one utility—Seattle Public Utilities.

P. 9 - Major threats to freshwater supply - groundwater contamination has not been addressed; (if this is to be addressed in another paper please disregard). We have provided references for this in our comments on the Water Quality paper.

P. 18, item A, Par. 2, - No reference to any efforts to reduce groundwater contamination.

P. 21, Other Strategies - Rainwater harvest is being used in San Juan County and City of Seattle.

P. 25, item A, par. 1 and final - No reference to any efforts to reduce groundwater contamination.

P. 41, Item B, Supply side strategies should include rainwater harvest.

p. 4, 2nd bullet—“declines” should be “has declined” and “exceeds” should be “has exceeded.” This suggestion is not merely editorial. We now manage (retain, detain, infiltrate) stormwater much differently than in the past, so it is not valid to assume that future changes in total impervious area will have the same impact as past changes in impervious area.

p. 5-6, B, “Current Adequacy of Freshwater Supply” and “Data Gaps and Uncertainties”—Although present day low-flows are undoubtedly a limiting factor for some freshwater ecosystems, it is a significant data gap that we have not yet estimated the likely range of natural historic streamflow variation in most Puget Sound basins and subbasins. It is likely that unimpacted “natural” flows were also a limiting factor for habitat function in some basins; there is little reason to expect that aquatic habitat was in the past “optimal” in all basins.

p. 6, “Exempt Wells”, 1st paragraph—It is straightforward to reasonably estimate the current number of exempt wells and quantify their cumulative impact on water supply. The USGS and others have done this in the past, and the USGS is currently doing this in the Lower Skagit, Chambers-Clover, Bainbridge Island, and Chimacum basins, as well as many eastern Washington basins. Albeit, it would be convenient to have such data ready at hand for the entire region.

p. 7, “Data Gaps and Uncertainties”, 1st bullet—There is a Federal program implemented by USGS that has compiled or estimated water use for all Washington Counties once every five years starting in 1985 (see <http://water.usgs.gov/watuse/wunwup.html>).

p. 8, D, “Water Quantity Data”—In support of past and current ground-water investigations in Puget Sound, the USGS has operated synoptic and short-term water-level networks that cumulatively are quite extensive. As of 1990, we had nearly 19,000 wells records in our publicly-accessible data base that had land surface information, water level data, and well depth information (reported in our analysis of the Hydrogeologic Framework of the Puget Sound Regional Aquifer System <http://pubs.er.usgs.gov/usgspubs/pp/pp1424D>). Most investigations added new data that allowed us to generate some information on status and trends of ground-water resources (for example see p. 39 in <http://pubs.er.usgs.gov/usgspubs/wri/wri944082>). A bibliography of USGS Publications concerning water resources in Puget Sound can be found at <http://puget.usgs.gov/pubs.html> .

P. 9, E—See General Comment above concerning “Current Knowledge” about consumptive use.

p. 9, E, 1st bullet—Given that we do not know what the range of natural historic variation has been in most basins and subbasins, it is likely that some instream flows have been set at levels that are greater than unimpacted flows. Thus, the resource may also be over-committed through what some may perceive as unachievable instream flow standards. I suspect this may not be the most common case, but flows based on “optimum” habitat availability can potentially exceed natural water availability.

p. 9, E, 3rd bullet—Development in the region has not universally led to reduced recharge. Water is supplied to much of the developed areas in the region either from mountain watersheds (Cities of Seattle, Tacoma, Everett, for example), or from pumpage of relatively deep aquifers (Kitsap PUD, City of Lakewood, for example). Irrigation and other non-consumptive uses of these waters has in many cases led to locally increased ground-water recharge and stream baseflow. Mercer Creek in Bellevue is an example, where trends in mean monthly June, July, August, or September flows from 1956-2007 are all significantly positive (see monthly statistics data at http://waterdata.usgs.gov/wa/nwis/nwisman/?site_no=12120000&agency_cd=USGS). A regional analysis of this has not been done, but the general assumption for reduced low flows following development may be incorrect.

p. 9, E, 6th bullet—Modified stream channels is a secondary rather than a major threat to freshwater availability. It does not fit well in this forum and could be better integrated into the habitat forum.

p. 10-11, G, Data Gaps—2nd bullet—Conceptually, there is hydraulic continuity between surface water and shallow ground-water throughout all of Puget Sound (see Morgan and Jones, 1999 at <http://pubs.er.usgs.gov/usgspubs/wsp/wsp2492> for the conceptual model). There are nuances concerning the nature of the connection, but

the connection has been well documented and I am not aware of a report that has shown no continuity between surface water and shallow ground-water.

Specific Comments related to Science Question 2

p. 18, Flow Setting Strategies—See general comments.

p. 25, A, 1st and 2nd bullets—Consumptive use is far less of a threat than water withdrawal (see general comment on S1). These first two bullets should be phrased as they were in S1:

- Over commitment of the resource through water withdrawals and diversions;
- Projected increases in domestic, municipal, commercial, and industrial water demand associated with population growth

Specific Comments related to Policy Question 1

p. 29, Source Exchange—Another source exchange technique couples reclaimed water with direct streamflow augmentation. This is what occurs when a sewage treatment plant discharges to a river rather than Puget Sound and it is worthy of recognition as a restoration strategy.

p. 32, Reclaimed Water—Most concerns in the Water Quality forum concern reuse as potable water. In this forum, consider reuse as streamflow augmentation. This is a supply side strategy rather than the demand side strategy of reusing treated water in lieu of withdrawals.

p. 32, Permit-exempt wells—The threat to ground-water supplies resulting from the so-called proliferation of permit exempt wells will likely be limited to specific subbasins with high concentrations of exempt wells, and even in these basins the threat is more directed at seasonal streamflows rather than overall ground-water resources. A good example of an evaluation of exempt well impacts on flow and alternative solutions for the Chehalis River Basin can be found at <http://www.crcwater.org/cbp/20030523xwip.html> .

Specific Comments related to Policy Question 2

p. 41, Proposed Action 1a—Unfortunately, the science to support instream flow rules adequate to support estuarine function will not likely be mature in the immediate future.

p. 41, Proposed Action 1b—The final sentence accurately describes the effectiveness of the strategy. It would be useful to point this out in the discussion related to science question 2.

p. 42, Proposed Action 2a—The regional assessment of water use and water needs could be substantially leveraged by cooperation and coordination with the existing USGS National Water Use Program (<http://water.usgs.gov/watuse/wunwup.html>) and the newly initiated USGS Water Census (<http://pubs.usgs.gov/fs/2007/3112/fs2007-3112.pdf>). The development of a

regional ground-water monitoring program would also benefit from the Water Census, and database development could be substantially leveraged by cooperation and coordination with the existing and accessible USGS National Water Information System (NWIS) database (<http://waterdata.usgs.gov/wa/nwis/nwis>).

p. 42, Proposed Action 2b—Also consider novel methods to reduce the impact of water withdrawals by improved management of non-consumptive water use.

Page 26 - The language regarding the relinquishment provision of the 2003 Municipal Water Law should be expanded to state that water rights certificated for municipal supply purposes based on works having been constructed are considered in good standing. See RCW 90.03.330 - section 3

Page 27 - Reclaimed water infiltration can be an important source of water for flow restoration efforts, especially when the ordinary discharge is direct to a marine body and impairment is not an issue (as in the case of the LOTT Alliance). This could be further highlighted.

Page 28 - Water Conservation Programs. The language regarding requirements under the Municipal Water Law regarding the water use efficiency rules is not entirely accurate. I suggest you work with Department of Health, Office of Drinking Water to more accurately describe the requirements for municipal water providers. For starters, the requirement for service meters should be highlighted.

Page 32 states that reclaimed water programs have been slow to take hold due to public acceptance and perceptions. I believe this is overblown. In Olympia, the use of reclaimed water has been well received by residents with very few concerns raised. I believe this issue may come more from a fear by utilities rather than a reality among residents. I suggest you not further perpetuate this fear. The biggest barrier preventing reclaimed water programs from advancing is cost, both to produce and purvey it (through separate distribution systems). I agree strongly with a later recommendation for more financial support for reclaimed water projects.

Page 43 - I'm not convinced that a state driven water conservation education program is the answer. The state might be better off supporting local programs that get more to barriers being faced locally. I suggest the state promote community based social marketing efforts, rather than just broad scale education.

Page 43 - under climate change 3.c, the strategies that address impacts in 3b should relate to adaptation rather than CO2 mitigation. Mitigation is important, but the focus for the Partnership has to be on adaptation (to changes in snow pack, precipitation patterns, sea level rise, etc.). Adaptation appears to be under addressed in the paper.

Page 44 - under 5d, water supply management plans - More description is needed on how these efforts would be led and how they would related to watershed plans/watershed planning units.

Page 44 - Much more discussion (and good thinking) is needed on how to better integrate land use planning, watershed planning, water quality planning, utility planning and ESA recovery planning. This is easy to include as a recommendation, but much harder to figure out what to do.

Page 45 - regarding benchmarks - it seems like this is a one size fits all list. I think this needs to be figured out more at a watershed level.

Page 46 - conservation targets were a hot button issue in the negotiation of the Municipal Water Law. It will be extremely difficult to get agreement on this at a regional level.

Pg 28. Because it is unknown how many water systems' plans include some of the projected growth of 1.4 million people (2020) noted in the paper, labeling human population (through consumption) as a "significant" threat to freshwater supply seems unsubstantiated. In addition, if the process works as the laws direct, growth will not be permitted where there is no legal right, or proven supply of water to serve it. Water right law, water system planning, and Growth Management Act provisions should highlight where growth can be accommodated based on water availability. This was not well explained or discussed in the paper (e.g. Page 28, "Growth Management"). Water System Planning: It would be helpful to have the paper clarify a number of items about Water System Plans (WSP) required by the Office of Drinking Water (ODW), Department of Health (DOH). WSP are not required for every public water system. In general, they are required for water systems with 1000 or more connections, brand new Group A community water systems, or systems of any size greater than 15 residential connections if expanding. ODW planning requirements are published at: http://www.doh.wa.gov/ehp/dw/Programs/water_sys_plan.htm. Smaller systems are required to plan, but those documents are not required to be submitted to ODW for review and approval. The planning document is also smaller in scope.

According to ODW statistics, there are 17, 264 public water systems in the state. Of those, 4193 have more than 25 people or 15 connections (Group A). There are 2273 Group A community water systems from 15 connections on up. If Puget Sound counties account for about one-half of all water systems in the state, then there would be around 1137 Group A community water systems to look at. The 13,071 Group B systems (14 connections or less; fewer than 25 people) in the state have no planning requirements. Existing plans are required to be updated every 6 years, though few meet the letter of the law. According to the ODW website, there are about 130 plans currently active in the planning process for the 12 Puget Sound counties. Assuming that this is about 2 years worth of submittals and on-going activities, it represents about 1/3 of the systems planning in the Puget Sound area. Then one might expect only about 390 water systems

to have “current” (within 6 years) information in the Puget Sound area. Perhaps ODW can be consulted for more exact numbers.

Pg 28 and elsewhere. Coordinated Water System Plans are in effect in critical water supply service areas. They are an effort to combine and coordinate planning by utilities in the given area. In those areas, all Group A community water systems must prepare and submit WSP. Water Conservation Programs: Suggest a more positive approach be taken (pg 28 and elsewhere). Seattle’s program is a good “urban” example. Many near-by utilities have commented that when the tiger roars, their water demand decreases – whether they have supply problems or not.

The fact that efficiency goals will vary by system is a good thing. (Page 28) Some systems are very leak-conscious already and should be rewarded. Others have failed to make improvements for many years and should set higher goals. Water systems must set their own efficiency targets – and make them known to their customers. They must also report on progress. Fresh water supply: Class A water and/or tertiary treatment should be noted as additional water supply. Public health is protected by the treatment level, and by the uses allowed for this resource. Water right laws may act as a barrier.

AWC Comments on Preliminary Strategies and Association Actions (AWC comments in *italics*)

1b. Update instream flow rules that were adopted prior to 1985. (Long-term)
The science for assessing instream flow needs and our understanding of aquatic habitat and flow relationships has improved substantially since adoption of these earlier rules. Older rules did not include provisions for permit-exempt groundwater management, water reserves for future consumptive use, and determination of seasonal and year-round closures. It is these management tools that make instream flow rule-making effective at managing impacts of human water use and allocation.

Not enough information to comment other than a caution that revisiting adopted instream flow rules at a time when numerous basins don’t have rules seems questionable. It would make the most sense to identify specific basins where instream flows MOST IMMEDIATELY impact the health of the Puget Sound and then identify strategies including, but not limited to, instream flow setting/adjustments, needed to improve the Sound’s health.

1c. Identify flow limitations and targets for fish as part of Salmon Recovery Plan

implementation. (Immediate)

- Develop WRIA-based inventories to determine where low- and high-flow problems occur.
- Establish the relationship between flows and viable salmonid populations.
- Identify salmonid recovery flow targets.

This work should be coordinated with the state effort to set instream flows,

salmon recovery planning, and the 2020 Action Agenda as a whole.

Appears reasonable and critically important.

1d. Assess adequacy of flows for estuarine and nearshore marine habitat including channel morphology and flows, salinity levels, and circulation. (Long-term)

Determine the range of freshwater inputs necessary to maintain healthy estuarine and marine nearshore habitats in Puget Sound. Assess total freshwater inputs to Puget Sound and trends in low- and high-flow inputs over time.

** How will such efforts complement and support local land use and environmental protection efforts, such as informing choices and decisions during updates of local GMA and Shoreline Management Programs?*

1f. Identify benchmarks for flow improvements and evaluate them. (Short-term)

Analyze streamflow trends for all of the major tributaries to Puget Sound and compare to instream flows set by rule. Identify metrics that indicate the benefits of flow improvements. Quantify those benefits for individual species. Collect the data that will quantify the benefits of flow improvements for individual species.

Sounds reasonable and somewhat complex. How will such information be used to assist decisions made by local, state, federal and tribal decision makers? Are there examples and potential priority responses to such information?

1g. Complete the task within the Puget Sound Salmon Recovery Plan for the development and implementation of comprehensive basin flow protection and enhancement programs (PEPS). (Short-term)

- Define the basic elements of a PEP and develop an initial checklist.
- Provide technical assistance and incentives for the development of PEPs in each WRIA.
- Develop benchmarks and performance measures.

Not enough information/input from cities to comment at this time.

Strategy 2: Identify water needs or goals for people by watershed (WRIA) and promote demand management.

Proposed Actions:

2a. Conduct a regionally consistent assessment of water use and future water needs, and availability. (Long-term)

- Estimate the quantity of ground and surface water use and future water availability by watershed (WRIA) or regional management area (action area) in the Puget Sound region. Integrate findings about water needs with reclaimed-water planning and stormwater planning.
- Develop an integrated and regionally accessible groundwater monitoring program (including some targeted streamflow monitoring) and associated database.

Good! What projections are being used to conduct this assessment? We would suggest, at a minimum, use of the Office of Financial Management (OFM) population projections provided to the 12 Puget Sound Counties that are used as the basis of their coordinated GMA planning with their cities.

2b. Promote sustainable water use practices through regulations and incentives addressing water use efficiency, use of reclaimed water, and storage. (Immediate)

- Recognize and support businesses with sustainable water use practices.
- Create and implement water use efficiency rules for all sectors of use.

Please acknowledge and include information that Municipal Water Providers with 1,000 or more connections, or who are deemed by the Department of Health as “growing,” must develop and adopt water conservation plans for the system and end users. No such other required efficiency plans are mandated at this time.

- Develop rules for water reclamation that promote potable water conservation.

There is a current rulemaking process – was it evaluated and found insufficient?

- Implement innovative water storage projects such as aquifer storage and recovery.

This is a VERY vague and potentially expensive to implement suggestion – more details please.

- Expand financial support and incentives for capital investments in water reclamation projects, particularly where there are willing partners and demonstrable environmental benefits.

Good idea, but what about expanding financial support and incentives for capital investments in water conservation projects? Please consider including this as well.

Perform outreach and education to address human expectations about water

use.

(Immediate)

Conduct a rigorous, regional conservation program that is specifically designed to address human expectations with respect to water availability and use. Increase the public understanding of how decisions about daily water use affect streams and aquatic ecosystems. A significant shift in social behaviors is needed to reduce current per capita water use.

Strategy 3: Assess the effects of climate change on water availability.

This is a critically important area of inquiry for cities that are water providers. It's something several of them are already assessing. It is hoped a broader assessment is coordinated with them.

Proposed Actions:

3a. Model climate impacts uniformly in the ESU. (Long-term)

Project the effects of a changing climate on streamflow over time by applying the model created by The Climate Impacts Group (CIG) at the University of Washington (Palmer, 2007) to all major watersheds in the Puget Sound region. Maintain a database of the information developed from the model that is available (through web access) to resource agencies and water suppliers. Update the assessments every 5 or 10 years to reflect new data and knowledge.

3b. Use the assessments of climate change (from 3a.) to estimate regional and local impacts on water supply, water demand, floods, groundwater, and the ability to meet instream flow requirements and fish targets. (Long-term)

3c. Develop strategies that address the impacts identified in 3b. (Long-term) As part of strategy development, the Department of Ecology will coordinate with the U.S. Mayors Climate Protection Agreement to seek ways to mitigate impacts and increase public awareness.

Strategy 4: Protect instream flows (compliance and enforcement).

Proposed Actions:

4a. Develop water use compliance and enforcement plans in each Puget Sound watershed. (Immediate)

Compliance and enforcement plans need to be coordinated with local watershed planning efforts (where planning is occurring). Compliance and enforcement plans should include a prioritized list of actions, associated budget estimates, and an implementation schedule.

Please distinguish between “where planning is occurring” and where planning is being IMPLEMENTED. We’d agree compliance and enforcement issues should be evaluated in areas when plans are being IMPLEMENTED, but not where “planning is occurring.”

4b. Establish water masters for each basin to ensure compliance with water code. (Short-term)

Water masters control the use of water within a specific district to which they are assigned, and can help to address the illegal use of water.

It isn't clear what this would accomplish to help restore the health of the Puget Sound. Please explain in more detail.

4c. Require metering and reporting for 80 percent of water use (by volume) in all watersheds. (Immediate)

Begin with “fish critical” Puget Sound watersheds (Nooksack, Snohomish, Cedar/Sammamish, Duwamish/Green, Puyallup/White, Chambers/Clover, Quilcene/Snow, and Elwha/Dungeness). Create a web-enabled database for metering data.

Not enough information to comment at this time.

Strategy 5: Affirm the social, legal and policy framework for water management.

Proposed Actions:

5a. Develop a process to recognize federally reserved instream flow water rights that is acceptable to federal, Tribal, state and other water interests. (Long-term)

Agree – not sure where it “fits in” among actions to list for this Agenda.

5b. Consider regulation of exempt wells by general permit, either statewide, by WRIA, or by region (e.g., Puget Sound region). (Immediate)

Need to review with a broad range of city interests before providing Comment

5c. Amend the current water code to streamline the water rights adjudication process.

(Long-term).

Develop a water right adjudication plan and schedule for each basin and allocate the necessary funding. Consider the funding and testing of pilot water courts.

Agree – not sure where it “fits in” among actions to list for this Agenda.

5d. Develop water supply management plans. (Short-term)

Supply management plans should coordinate area infrastructure and development, water demand and supply projections, storage, reclaimed water, source exchange, strategies to meet water demands and instream flow needs associated with population growth, and drought preparedness plans

tailored to each watershed. The scale of these plans is dependent on the area of Puget Sound being addressed. For central Puget Sound, the regional water supply management plan will encompass the three-county region (and most of five WRIAs). For other areas in the Puget Sound ESU, the “regional water supply plans” would take the form of a basin assessment, by WRIA. Water supply management planning will include reexamining and updating existing water availability determinations and closures to support improved streamflows and shape strategies to provide water for future needs of people. Use watershed planning information where possible.

Not enough information and perspectives of various cities yet to comment.

Strategy 6: Address policy linkages.

There is a need to further evaluate and identify ecosystem-wide, integrated management programs. The recommendations below begin to address this need.

Proposed Actions:

6a. Develop a process to integrate land use planning, watershed planning, water quality planning, utility planning and ESA recovery planning.

(Immediate)

Specifically include the linkage between land use planning and water use planning.

Strongly question that such efforts aren't already underway and linkages in place. This is particularly so in cities – the urban and urbanizing areas within the 12 Puget Sound Counties. There are ways and strategies needed to improve the processes. Please consider specific suggestions on how to do so in urban and urbanizing areas.

6b. Consider instream flow needs during planning and permitting for stormwater and reclaimed water infrastructure. (Long-term)

Not enough information/city perspectives to comment at this time.