

DSS Worksheet Compilation Summary

Version 2, September 14, 2001

Compilation Summary Purpose

The DSS Worksheet Compilation Summary, Version 2 seeks to compile the issues raised thus far by Planning Unit member caucuses per Utah State University's request that participants in the WRIA 1 Watershed Management Project clarify the issues they wish to have the DSS address in exploration of options for watershed management plan development. The DSS worksheet development is an iterative process that allows for caucuses to revise and add issues to be addressed. This summary is not intended to be a complete list of all issues that may be raised or considered in the WRIA 1 Watershed Management Project. It is a snapshot of what has been identified to date by caucuses through Utah State University's DSS worksheet information collection activity and the changes recommended by caucuses to Version 1 of the Compilation Matrix and Summary as of September 14, 2001.

The Planning Unit facilitators reviewed Version 1 and 2 worksheets as submitted by caucuses and reviewed for additional clarification by the Staff Team's DSS Ad Hoc Committee. The text in both the Compilation Matrix and Summary are drawn from the issue/ problem synopsis and performance measures sections of the DSS worksheets only. Management Alternatives, Background Conditions, and Beneficiary sections of the DSS worksheets will be worked with at a later time in the process of DSS development.

Compilation Summary and Structure

The Summary is grouped under Habitat, Instream Flow, Water Quality, and Water Quantity sections, per the technical components of the WRIA 1 Project scope of work. Caucus DSS worksheet statements are further grouped in Common and Potentially Opposing Issues sections. The numbered summary statement in bold was written by the Planning Unit facilitators to indicate the topic and interests that are common between caucus worksheets or potentially opposing. These numbered Summary statements in bold are followed by *selected portions of text from the caucus DSS worksheets that were found to be in common or potentially opposing by the Planning Unit facilitators.*

Habitat Issue/Problem Synopsis Statements – COMMON

1. Common desire for technical information and analysis that will indicate how changes in land use and zoning or mitigating measures applied to land use and zoning will impact the overall habitat in WRIA .

“How will other land uses downstream or upstream of forestry designated areas be evaluated for impacts that occur outside the control of forestry designated areas, which are highly regulated by state and federal law? E.g. Fishbearing streams through viable channels in forestry areas connect to agricultural, ditches, and culverts that pose impediments to habitat, water quantity, and water quality. It means that there is a lack of consistent standards, for example a stream segment that passes through agriculture then through forestry, then through agriculture and then through residential areas may have varying requirements for buffer zones through each area)” **(For 1 v1)**

“Habitat loss is due to many uses, including impervious surfaces, but the impact of private wells on instream flows is negligent to non-existent. Ranking of changes in the different uses impact on instream flows should be considered” **(PWO 2.13)**

“How would a reduction in existing forestry lands impact habitat and needed water quality and quantity in the WRIA 1? Any conversion from forestry to non-forestry. Would restate question “How do conversions from forestry to non-forestry impact habitat...” **(For 2v2)**

“Approximately 10 miles of main channel riverine habitat and a saltwater estuary are downstream of the PUD facilities. These habitats are potentially affected by PUD water withdrawals at Plants 1 and 2. Functional habitat uses in both these environments are fish migration and rearing.” **(PUD 5 v2)**

“What are the impacts of changes in land-use on spatial and temporal distribution of water in the Nooksack River and surrounding basin? How do these changes affect historic habitats for all life stages of native fish species, including salmon? A better understanding of the hydrology and land use of the individual sub-basins will allow us to examine the relationship among land use, water use, water flow rates, groundwater levels, watershed processes, viability, quality and connectivity of habitats. The relationships will allow us to better determine how to manage land and water use to promote salmon recovery in order to provide re-establishment of meaningful fisheries.” **(Nook 1v1)**

“The caucus also feels that when it is no longer possible to farmland, it should be remembered that this could mean conversion of the land to potentially more intensive land uses such as urban development. These intensive land uses may have a larger negative impact on fish than agriculture is perceived to have. Mitigating measures need to happen that would guarantee water supply and help the streams. It means mitigating measures taken by farmers and others. Water quality, quantity, and habitat must be ensured for future generations.” **(Ag 1v2)**

“Current and historic land-uses and future land-use patterns that evolve under the policies and regulations administered by the County have had, or will have, direct and indirect temporal and spatial effects on the physical and biological processes that create properly functioning habitat conditions used by chinook salmon and bull trout listed as "threatened" under the Endangered Species Act (ESA)” **(WC 4v1)**

“Impact of Agricultural Land Conversion on Water Quantity and Quality Agricultural land is being converted to other types of land use. It is important to understand the true impacts of such conversions in terms of the short- and long-term implications for water use, water quality, fish habitat, and other factors. For example, conversion to non-agricultural use could result in less pollution due to manure application or other contributions to nitrate in ground waters. On the other hand, total water use might increase depending on the original quantity of water used and the new use. The new development could be on a sewer system or could be on septic. If the septic systems fail to work properly in a few years, ground water contamination may again be a problem. The range of

potential impacts associated with the conversion should be considered in making the determination of whether to change zoning and approve subdivision of land.” **(State 10v1)**

“Evaluate the accuracy of existing land use/ land cover data; collect additional land use/ land cover data if necessary.” **(Lum7v1)**

2. Shared concern regarding sufficient water of good quality for the habitat needs of salmonid populations across all life stages.

“Currently there is a dearth of natural spawning in the Nooksack system. This is due in part to decreased water quality and degradation of habitat. Alteration of natural stream flows has created a multitude of problems, resulting in negative impact. Additional concerns include shade or lack thereof, siltation, pollution, and impervious surfaces. The caucus recognizes this is only a partial list. Adequate year-round, in-stream flows (volume and flow) and sufficient quality of water to assure successful spawning (natural and artificial, acultured) and rearing of salmonid populations is needed. Appropriate levels means whatever level is necessary to support the diverse fish species and lifestage needs. Related needs such as temperature and water clarity should also be considered. These needs should be considered for the various species and life stages and it is expected that they will vary.” **(Fis 2v2)**

“What are the most significant factors that contribute to water temperature standards exceedences? What management options present the best chance of decreasing water temperature during summer months (July, August and September)? Water temperatures in the South Fork and Main Stem Nooksack River routinely exceed water temperature standards.” **(Nook 2 v1)**

“The use of residential and agricultural pesticides in the county may be having a negative affect on the biota in the watershed. Information is sought to enable local planners to consider the importance of this impact as the watershed planning process continues.” **(Env 1v2)**

“For all the water bodies within the WRIA listed on the 303d list which ones have plans currently in place that are adequate to address the water quality impairments that they are listed for? Are there water bodies within the WRIA that potentially have water quality impairments that would make them candidates for listing on the 303d list, but because of lack of testing or follow-up they have not been listed? Potentially which ones, and for what parameters?” **(Env 4 v2)**

“Determine areas and flow characteristics of spring fed wetlands and small tributary fish spawning/rearing areas. Analyze and map geology, hydrology and related habitat functions.” **(State 6 v1)**

“Determine areas and flow characteristics of spring fed wetlands and small tributary fish spawning/rearing areas.” **(State 15 v1)**

“Current and historic land-uses and future land-use patterns that evolve under the policies and regulations administered by the County have had, or will have, direct and indirect temporal and spatial effects on the physical and biological processes that create properly functioning habitat conditions used by chinook salmon and bull trout listed as "threatened" under the Endangered Species Act (ESA) and by other native fish species. The ability to achieve the above goal is limited by the lack of a comprehensive mechanism to synthesize multiple data sets into viable management alternatives. The DSS will need to be able to help the County develop and evaluate the ability of various land management scenarios to: maintain properly functioning habitat conditions; to restore PFC in the range of habitats sufficient to meet ESA and salmonid recovery goals; and to meet water quality standards under the federal Clean Water Act.” **(WC 4v1)**

“The issue is that the City of Bellingham diverts water from the middle fork of the Nooksack River. There is a concern about how reductions of the diversion flow will reduce the quantity of water available for municipal purposes, in-stream flow for Whatcom Creek, and Lake Whatcom level control; and also how it may impact water quality in Lake Whatcom and Whatcom Creek.” **(Bham 1v1)**

“Use the best available science to make reliable estimates of the total amount of available water in the WRIA (undepleted condition).” **(Lum 1v1)**

“Identify funding sources and conduct a depletion analysis to accurately estimate the spatial and temporal uses of water in the WRIA throughout the year.” **(Lum8v1)**

“Identify funding sources and conduct an analysis to estimate optimal instream flows for the fisheries resources in the WRIA through the year.” **(Lum10v1)**

“Moreover, there is an imbalance in the percentages in the wild/native versus hatchery-raised salmonids. The term “wild” should be replaced with “naturally spawning”. More emphasis should be placed on increasing populations of naturally spawning fish. This is not intended to say there shouldn’t be any hatchery fish. Naturally spawned fish should be maximized and supplemented with hatchery fish if this will not inhibit natural production. It should be emphasized that the intent is not to eliminate hatchery fish, rather to achieve a balance of natural and hatchery production. The ratio of smolts to returning adult spawners may be one of the more accurate measures of improvement in the Nooksack salmon stocks. Performance measures: Get base-line figure on number of fish entering the Nooksack. Measure that in years to come to see if populations are increasing or not. Historical data on fish runs are needed to determine spawning schedules (competition among species). Also, insect populations need to be determined. The caucus was referring to the insects as part of the food web – they recognize that insects are an important part and are needed for fish.” **(Fis 1 v2)**

“Drainage ditches need to be maintained in a clean and open condition so productive farmland can continue to be productive and allow manure to decompose aerobically resulting in less pollution.” **(Dik1v1)**

3. Common desire for habitat improvement expectations and recommendations to take into consideration the viability and cost/ benefit returns of such efforts.

“Habitat needs to be improved in a way in which 10 percent effort returns 90 percent of the solution. The Caucus feels that improvements should be made starting with the small solutions that result in the biggest improvements (the biggest bang for the buck). Care should be taken to stop actions at the point in which additional expenditures and actions result in very little improvement (marginal returns).” **(Ag 1v2)**

“What percentage of the salmon habitat work done in Whatcom County remains viable after three years? After five years? After ten years?” **(Env 4v2)**

“What are the expectations for re-habitation of salmon, need to be realistic.” **(PWO 2.14)**

“A cost/benefit analysis be included and expressed in quantitative terms, with particular emphasis on diminishing returns.” **(LD 1.7 v1)**

“There is no question that fisheries habitat could stand improvement and that there are ample opportunities for enhancement. Ample opportunities mean that there are currently a lot of actions that can be taken to address problems. That is actions taken to improve habitat should be evaluated by how many additional fish breed and migrate downstream as a result. Small solutions that are cost effective can achieve significant results. Water

systems and their customers are not willing to support endless amounts of money spent and regulations enacted without seeing any benefit on the bottom line. The threshold is the point of diminishing return.” (NMWS 2 v2)

“Small city wastewater discharge requirements and whether the more stringent requirements are effectively improving water quality; specifically, with regard to the added cost. The issue is one of cost/benefit analysis for capital and operational improvements and the added benefit to water quality.” (SmCi 1v1)

“If buffers are established along the ditches and revegetated with trees, ability to access ditch for cleaning may be impaired.” (Dik1.6v1)

“Districts need to be able to perform maintenance of diking and drainage systems in a timely, cost-effective and legal way; permitting needs to be possible in a timely fashion.” (Dik1.4v1)

4. Common need for data collection, compilation, and analysis methods to provide reliable data accompanied by clearly articulated level of uncertainties and probable error information for utilization in the decision support system and recommendation development.

“Technical scope of work- need to review for adequacy to as data collection information comes in. Is new or additional information needed? Concern about biased studies. 4. Some other factors, drought, etc. could affect data. Is there enough history?” (PWO 2.26)

“Since relatively few stream reaches within the WRIA will actually receive "intensive" analysis, and since there is some question regarding the quality of data which may be derived from the "rapid assessment" methodology, and further since the "extrapolation" methodology, which is proposed by USU to analyze the high percentage of streams within the WRIA that will not be directly measured either "intensively" or "rapidly", has yet to be peer-reviewed, what protocols or methodologies will be incorporated into the DSS system to manage the uncertainties inherent in both the data and in the methodologies presently proposed to analyze those data in relation to the biological components of the system?” (Env 7 v2)

“As a responsible primary water user the PUD desires to operate on adequate and accurate habitat and instream flow information.” (PUD 5 v2)

“Concerning all technical areas of the Scope of Work and all studies in the WRIA 1 Project, the Land Development Caucus will require that all data collection, modeling, and all other scientific and professional data collection, findings, results and conclusions will have associated with them the probable error and the quantified data limitations of those data, findings, results, conclusions, or products. If probable error is not assessed then it should not be considered a finding of fact.” (LD 1.1)

“The ability to achieve the above goal is limited by the lack of a comprehensive mechanism to synthesize multiple data sets into viable management alternatives. The DSS will need to be able to help the County develop and evaluate the ability of various land management scenarios to: maintain properly functioning habitat conditions; to restore PFC in the range of habitats sufficient to meet ESA and salmonid recovery goals; and to meet water quality standards under the federal Clean Water Act.” (WC 4 v1)

“Existing watershed management plans: How many approved watershed plans exist in WRIA 1 (Drayton Harbor, Ten Mile Creek, Kamm Creek, Lake Whatcom, etc.)? Of those plans how many have met the implementation schedules for their action items? Of the plans how many have led to improvements in the targeted water quality parameters? If plans have not met the source control goals state in them what are the reasons for lack of success? What lessons from the successes and failures of these plans can be helpful for the WRIA 1 planning process?” (Env9v1)

5. Common desire for habitat improvements to be evaluated by how many fish breed and migrate downstream and that habitat improvement effectiveness not be limited to fish that return home.

“Actions taken to improve habitat should be evaluated by how many additional fish breed and migrate downstream as a result. The measurement of success should not be the numbers of fish returning, because there are so many factors outside the control of inland residents and policy makers that influence those numbers. LD asks USU to make a recommendation on reasonable measures for habitat improvements’ effectiveness that are not based on or limited to fish that return home.” (LD 1.6 v1)

“There is no question that fisheries habitat could stand improvement and that there are ample opportunities for enhancement. Ample opportunities mean that there are currently a lot of actions that can be taken to address problems. That is actions taken to improve habitat should be evaluated by how many additional fish breed and migrate downstream as a result. The measurement of success should not be the numbers of fish returning, because there are so many factors outside the control of inland residents and policy makers that influence those numbers.” (NMWS 2v2)

6. Common desire for stream course remediation actions to be taken to maximize habitat improvement opportunities.

“Stream course remediation through redevelopment of structure of the riparian zone to aquatic zone. Aquatic zones can be included in actions; need to look at the morphology of streambeds not just tree planting.” (For 3 v2)

“The Critical Areas Ordinance requires agricultural landowners to maintain vegetated buffers of 50 to 100 feet along all rivers and streams in order to protect riparian functions that influence fish and wildlife habitat quality, in addition to floodwater attenuation, erosion control and cultural or recreational uses. This program requires property owners to develop conservation plans, and submit them to the Whatcom Conservation District (WCD) for review and approval. ... inform property owners whose existing or planned agricultural activities are not in compliance with critical areas requirements and refer them to the WCD, and (2) enforce property owner compliance with approved conservation plans. Since passage of the Critical Areas Ordinance, Whatcom County's Planning and Development Services has not adequately staffed this part of their Shoreline Master Program and many violations of the Critical Areas Ordinance go unchecked. Will full implementation and enforcement of Whatcom County's Critical Areas Ordinance on agricultural lands have a measurable improvement on surface water quality and quantity and for aquatic life within Whatcom County? Whatcom County's agricultural landowners do not consistently use Best Management Practices (BMP's) contained within Farm Plans (FP's) and, as a result, cause surface and/or groundwater pollution. Pollution of Washington State's waters by Whatcom County's farms creates negative impacts to both private and public owned natural resources. These negative impacts include, but are not limited to: higher tax burdens for Washington's citizens and increased environmental degradation that threatens public health or the physical, chemical or biological health of aquatic systems, including groundwater aquifers. The problem with the critical areas ordinance is not one of substance; it is due to inadequate staffing and enforcement by Whatcom County's government.” (State 4 v1)

“Operation of diking and drainage districts should utilize best management practice.” (Dik1.5v1)

“Permitting process should be streamlined; ideally, one application should be used for all permits, facilitate the process should be facilitated by a single location or agency.” (Dik1.7v1)

“Drainage districts may not have the authority to do things mandated by permit requirements (e.g. planting on private property).” (Dik1.8v1)

“Concern about possible future costs attributed to private well owners and use of cost as a method to promote conservation.” (PWO 2.27)

7. Common desire for data management and mapping activities within the WRIA 1 Watershed Management Project to provide up to date and complete inventory of all stream segments that provide habitat functions.

“Vital habitat exists in the basin that is not even identified on maps. Potential or current fish bearing streams. This includes “holes” that support fish in small streams. Sometimes only pieces of stream segments are identified without upstream or downstream segments identified. What maps are they referring to? DNR Base maps. Could they provide the data to complete the map? Updates on newly identified fish bearing streams and water courses located through forestry practice activities need to be integrated into WRIA 1 Project maps and databases in the basin. FPA’s. Noted that map updates may be infrequent and may be reason why some information is not cataloged. There needs to be a way to flag isolated stream segments and capture stream segments downstream and upstream of fish populations and ensure that new data is cataloged)” (For 1 v1)

“Determine areas and flow characteristics of spring fed wetlands and small tributary fish spawning/rearing areas. Analyze and map geology, hydrology and related habitat functions.” (State 6 v1)

“Data collection: 1. Technical scope of work – need to review for adequacy as data collection information comes in. Is new or additional information needed? 3. Concern about biased studies. 4. Some other factors, drought, etc. could affect data. Is there enough history?” (PWO 2.26v1)

“What are the expectations for re-habitation of salmon need to be realistic. Put reality into salmon stream listings; if streams are not moving year-round, note that correctly in class of stream. There needs to be accuracy.” (PWO 2.14v2)

8. Property compensation for habitat remediation and mitigation measures.

“Rights of property owners will be affected by setbacks and habitat corridors; will farmers be compensated for loss of the ability to keep land in production?” (Dik4v1)

“Economics and Preservation of Lifestyle – Overpopulation; Concern about possible future costs attributed to private well owners and use of cost as a method to promote conservation. This includes potential property loss to achieve remediation efforts and costs. Though the setbacks are good, there needs to be flexibility to deal with setbacks and owner property value.” (PWO 2.27v1)

9. Common interest in addressing the public education and information needs to best support efforts to protect water resources.

“Public education and attitudes: What is currently known about WRIA 1 residents’ knowledge and attitude about water issues? Does current knowledge and attitudes aid, or stand in the way of, moving forward with science based solutions in WRIA 1?” (Env13v1)

“Efforts need to be made to restore public trust so diking and drainage districts are seen as water protectors.” (Dik3v1)

Habitat Issue/Problem Synopsis Statements – POTENTIALLY OPPOSING

1. Potentially divergent concerns regarding stream buffers and their impacts on farmers and water quality.

“There are concerns about stream buffers. The Caucus is particularly concerned with the usability of the land area. Buffers can reduce the land available for farming and this is a concern to them. Ability to farm the land Enhancement of habitat needs to take place without destroying the farmer. The term destroying refers to many things including economic destruction, cultural destruction, and social destruction. The caucus also feels that when it is no longer possible to farmland, it should be remembered that this could mean conversion of the land to potentially more intensive land uses such as urban development. These intensive land uses may have a larger negative impact on fish than agriculture is perceived to have. Mitigating measures need to happen that would guarantee water supply and help the streams It means mitigating measures taken by farmers and others.”
(Ag 1 v2)

“Ordinance requires agricultural landowners to maintain vegetated buffers of 50 to 100 feet along all rivers and streams in order to protect riparian functions that influence fish and wildlife habitat quality, in addition to floodwater attenuation, erosion control and cultural or recreational uses. The Critical Areas Ordinance allows for smaller stream or river buffers (<50 or 100 feet) to be instituted by agricultural landowners if they comply with the requirements of the Whatcom County's Conservation Program on Agricultural Lands (CPAL). This program requires property owners to develop conservation plans, and submit them to the Whatcom Conservation District (WCD) for review and approval. Requirements and refer them to the WCD, and (2) enforce property owner compliance with approved conservation plans. Since passage of the Critical Areas Ordinance, Whatcom County's Planning and Development Services has not adequately staffed this part of their Shoreline Master Program and many violations of the Critical Areas Ordinance go unchecked. Will full implementation and enforcement of Whatcom County's Critical Areas Ordinance on agricultural lands have a measurable improvement on surface water quality and quantity and for aquatic life within Whatcom County? Whatcom County's agricultural landowners do not consistently use Best Management Practices (BMP's) contained within Farm Plans (FP's) and, as a result, cause surface and/or groundwater pollution. Pollution of Washington State's waters by Whatcom County's farms creates negative impacts to both private and public owned natural resources. The se negative impacts include, but are not limited to: higher tax burdens for Washington's citizens and increased environmental degradation that threatens public health or the physical, chemical or biological health of aquatic systems, including groundwater aquifers. The problem with the critical areas ordinance is not one of substance; it is due to inadequate staffing and enforcement by Whatcom County's government. (State 4 v1)

Instream Flow Issue/Problem Synopsis Statements – COMMON

1. Common need for a scientific definition of hydraulic continuity and a standard that can be utilized throughout the WRIA 1 for use in making water allocation decisions.

“How are aquifers playing into the determination of how wells affect water availability? How will the continuity between ground water and instream flow be assessed; there is a large variation in continuity from geographic area to area and variations by season.” (PWO 2.6)

“Provide a Scientific definition for hydraulic continuity, not a legal definition or a government agency's current definition. We ask that a science based definition for hydraulic continuity meaningful and relevant in applied science (i.e. what order of magnitude transfer of flow from one stream to another is relevant?).” (LD 1.2)

“The current standard for determining impairment of one water body determined to be in hydraulic continuity with a current or proposed source of withdrawal is any amount of flow between the two. There is little hope of developing a rational water allocation management plan as long as this standard is applied to instantaneous flow rates (Qi). There is thus need to develop an agreed-upon pragmatic standard that can be applied realistically in making water allocation decisions within WRIA 1.” (NMWS 3 v2)

“Assurance of hydraulic continuity issue. Will increasing withdrawal from Everson’s Strand Road well influence surface water levels? Another issue associated with withdrawal (both surface and ground water) is withdrawal from one area and it being discharged to an area outside of where it was withdrawn or consumed. How is this being accounted for in water use and availability quantification?” (Sm Cit 2 v1)

“Lack of understanding regarding hydraulic continuity throughout WRIA 1. The extent to which ground water withdrawals impact surface water flows needs to be determined to appropriately understand the physical availability of water.” (PUD 7 v2)

“What can be done to mitigate or augment flows? What advantages can be gained by transferring from surface to groundwater, and vice versa? What is the rate and timing of the effect groundwater has on surface water? If water is taken out a given distance from a stream what affect, if any, does it have? If there is an affect what can be done to mitigate it?” (Ag 2v2)

“Specific issues for the small cities include...Blaine – ground water supply and how wells are going to be addressed in WRIA (how will Blaine’s aquifer be characterized?)” (SmCi 4v1)

“It is an issue of how to ensure adequate water resources to the agriculture community If there is a problem, what time of year is there a problem? What can be done to mitigate or augment flows? What advantages can be gained by transferring from surface to groundwater, and vice versa? What is the rate and timing of the effect groundwater has on surface water? If water is taken out at a given distance from a stream what affect, if any, does it have? If there is an affect, what can be done to mitigate it?” (Ag 2v2)

2. Common need for a better understanding of the instream flow level needs for habitat throughout salmon life stages and the relationship of these needs and human consumptive impacts on the instream flow levels.

“How to ensure adequate resources to the agriculture industry to achieve workable solutions to allow change and growth? It is an issue of how to ensure adequate water resources to the agriculture community – at least until the point that it’s fully paved over referring to the potential loss of ag land to development, or loss due to regulatory issues making farming untenable. If there is a problem, what time of year is there a problem? What can be done to mitigate or augment flows?” (Ag 2v2)

“What are the impacts of changes in land-use on spatial and temporal distribution of water in the Nooksack River and surrounding basin? How do these changes affect historic habitats for all life stages of native fish species, including salmon? Water “availability” at critical salmon life stages has the crucial impact of determining the difference between survival and mortality. A better understanding of the hydrology and land use of the individual sub-basins will allow us to examine the relationship among land use, water use, water flow rates, groundwater levels, watershed processes, viability, quality and connectivity of habitats. The relationships will allow us to better determine how to manage land and water use to promote salmon recovery in order to provide re-establishment of meaningful fisheries.” (Nook 1 v1)

“Adequate year-round, in-stream flows (volume and flow) and sufficient quality of water to assure successful spawning (natural and artificial, acultured) and rearing of salmonid populations is needed. Appropriate levels means whatever level is necessary to support the diverse fish species and lifestage needs. The caucus is not

making a judgment about existing legal in-stream flows nor are they saying there is or isn't enough water currently. They do not know if there is or isn't but feel that we need to make sure there is sufficient water.” **(Fis 2 v2)**

“The City of Bellingham has a 125 cfs instantaneous water right with a point of withdrawal on the Middle Fork Nooksack River. The diversion is managed to avoid flow depletion in the Middle Fork below the current instream flow low flow settings. Future management of the diversion will be based on instream flow and habitat effects to the Middle Fork and Mainstem Nooksack.” **(Bham 3 v1)**

“Use the best available science to make reliable estimates of the total amount of available water in the WRIA (undepleted condition).” **(Lum 1v1)**

“Identify funding sources and collect climate data at representative locations within the WRIA to allow the precipitation and evapotranspiration components of the water budget to be accurately estimated for each month.” **(Lum6v1)**

“Evaluate the accuracy of existing land use/ land cover data; collect additional land use/ land cover data if necessary.” **(Lum7v1)**

“Identify funding sources and conduct a depletion analysis to accurately estimate the spatial and temporal uses of water in the WRIA throughout the year.” **(Lum8v1)**

“Estimate undepleted streamflow based on collected streamflow data and the depletion analysis results.” **(Lum9v1)**

“Identify funding sources and conduct an analysis to estimate optimal instream flows for the fisheries resources in the WRIA through the year.” **(Lum10v1)**

3. Common desire for data collection, compilation, and analysis methods to provide reliable data accompanied by clearly articulated level of uncertainties and probable error information for utilization in the decision support system and recommendation development.

“Since relatively few stream reaches within the WRIA will actually receive "intensive" analysis, and since there is some question regarding the quality of data which may be derived from the "rapid assessment" methodology, and further since the "extrapolation" methodology, which is proposed by USU to analyze the high percentage of streams within the WRIA that will not be directly measured either "intensively" or "rapidly", has yet to be peer-reviewed, what protocols or methodologies will be incorporated into the DSS system to manage the uncertainties inherent in both the data and in the methodologies presently proposed to analyze those data in relation to the biological components of the system?” **(Env 7 v2)**

“Action based on future fears: realistic solutions scientific versus political” **(PWO 2.25)**

“As a responsible primary water user the PUD desires to operate on adequate and accurate habitat and instream flow information.” **(PUD 5 v2)**

“Land Development Caucus require that all data collection, modeling, and all other scientific and professional data collection, findings, results and conclusions will have associated with them the probable error and the quantified data limitations of those data, findings, results, conclusions, or products. If probable error is not assessed then it should not be considered a finding of fact.” **(LD 1.1 v1)**

“Existing watershed management plans: How many approved watershed plans exist in WRIA 1 (Drayton Harbor, Ten Mile Creek, Kamm Creek, Lake Whatcom, etc.)? Of those plans how many have met the implementation schedules for their action items? OF the plans how many have led to improvements in the targeted water quality parameters? If plans have not met the source control goals state in them what are the reasons for lack of success? What lessons from the successes and failures of these plans can be helpful for the WRIA 1 planning process?” (Env9v1)

“Data collection: 1. Technical scope of work – need to review for adequacy as data collection information comes in. Is new or additional information needed? 3. Concern about biased studies. 4. Some other factors, drought, etc. could affect data. Is there enough history?” (PWO 2.26v1)

4. Common desire to explore the impacts of groundwater withdrawals on instream flows and seek opportunities for aquifer recharge and storage options to increase instream flows during depleted periods.

“What are the spatial and temporal variations to surface water flow in the South Fork Nooksack River, the Main Stem and its tributaries that would result from withdrawing groundwater instead of diverting surface water? How would the surface water flows change with the removal of the tile drain systems throughout the lower Main Stem basin? How could the groundwater withdrawals be distributed in space and time to minimize surface water depletion; how can water use during summer months be better managed to promote higher instream flows (besides reducing water use)? Aquifers depleted during summer months might induce an increase in groundwater recharge during winter months when there is an excess of precipitation, and instream flows often exceed regulated flows by significant amounts.” (Nook 3 v1)

“Aquifer Storage and Recovery (ASR) Synopsis: For each drainage with instream flow or other water supply constraints, can we store surface water in aquifers during the high flow periods, and then withdraw it during low flow periods, both to meet instream flows and provide additional water supplies for other needs? The stunted economic growth is results from municipalities and water associations not being able to supply water for homes and other buildings. By not being able to provide a basic and required resource when it is needed, growth is curtailed.” (NMWS 1 v1)

“Consider the potential impact of small water users; clarification of actual return use versus amount taken out; and the water contribution by private wells should be assessed (through-flow).” Recharge of aquifer through private well owner septic, how will this value be quantified? (PWO 2.5)

“How is open pit gravel mining impacting the water quantity (evaporation) and water quality (contamination) on aquifers and streams being considered? 2. Impact of instream gravel mining on streams need to be considered.” (PWO 2.9)

“These habitats are potentially affected by PUD water withdrawals at Plants 1 and 2. Functional habitat uses in both these environments are fish migration and rearing. As a responsible primary water user the PUD desires to operate on adequate and accurate habitat and instream flow information.” (PUD 5 v2)

“What can be done to mitigate or augment flows? What advantages can be gained by transferring from surface to groundwater, and vice versa? What is the rate and timing of the effect groundwater has on surface water? If water is taken out a given distance from a stream what affect, if any, does it have? If there is an affect what can be done to mitigate it?” (Ag 2v2)

5. Common need for the various types and sources of withdrawal to be considered based on the degree of impact when developing instream flow information.

“The impact of private wells on instream flows is negligent to non-existent. Ranking of changes in the different uses impact on instream flows should be considered.” (PWO 2.13)

“How is open pit gravel mining impacting the water quantity (evaporation) and water quality (contamination) on aquifers and streams being considered? 2. Impact of instream gravel mining on streams need to be considered.” (PWO 2.19)

“These habitats are potentially affected by PUD water withdrawals at Plants 1 and 2. Functional habitat uses in both these environments are fish migration and rearing. As a responsible primary water user the PUD desires to operate on adequate and accurate habitat and instream flow information.” (PUD 5 v1)

“Habitat loss is due to many uses, including impervious surfaces, but the impact of private wells on instream flows is negligent to non-existent. Ranking of changes in the different uses impact on instream flows should be considered.” (PWO 2.13)

“There is a need to evaluate the creation of impervious surfaces for their adverse impact on the underlying aquifers in terms of changes to recharge. In some cases, the reliability of water supplies for existing water rights using water from the aquifers overlain by impervious surfaces may be jeopardized.” (State 11 v1)

“Determine areas and flow characteristics of spring fed wetlands and small tributary fish spawning/rearing areas. Determine hyporheic zone for Nooksack drainage. Analyze and map geology, hydrology and related habitat functions.” (State 15 v1)

“1. Consider the potential impact of small water users; clarification of actual return use versus amount taken out; and the water contribution by private wells should be assessed (through flows). Consider the recharge private wells provide through septic, irrigation or other beneficial uses. How will this value be quantified?” (PWO 2.5)

6. Common concern that the instream flow settings used by the State to determine water availability are based on data that may not be based in the best available science.

“Currently, many WRIA 1 drainages are closed to further water withdrawals due to perceived over-appropriation and/or failure to meet instream flows. The perception of over-appropriation and failure to meet instream flows results from actions by the state to close basins regardless of whether there is agreement on the information used to close the basins. The perception is a general one that is generated by the fact that because the state took the actions, the resource must therefore be over appropriated.” (NMWS 1 v2)

“Instream flows set for WRIA 1 and adopted into law in 1985 are based on inadequate study methods and unsubstantiated assumptions regarding baseline conditions. As such, flow settings and their technical bases are inadequate and faulty and should not be the basis for determining availability of water for out-of-stream use or for the instream flow needs of aquatic resources.” (PUD 6 v2)

7. Common concern for balancing instream flow and water supply needs of the basin.

“Balance Needs· Instream vs. out-of-stream water uses· Unrealistic expectations to rehabit (fish) the basin · Fish versus people” (PWO 2.22)

“The goal of the instream flow component is to supply water in sufficient quantities to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve habitats on which fish rely. Concerns exist that there may be insufficient water to implement current land use policies e.g., environmental, agriculture, forestry, growth areas including consumptive and non-consumptive needs.” **(WC 3 v1)**

“The issue is that the City of Bellingham diverts water from the middle fork of the Nooksack River. There is a concern about how reductions of the diversion flow will reduce the quantity of water available for municipal purposes, in-stream flow for Whatcom Creek, and Lake Whatcom level control; and also how it may impact water quality in Lake Whatcom and Whatcom Creek.” **(Bham 1 v1)**

“The concern is that present land uses impact Lake Whatcom water quality. Public ownership and/or control will improve water quality or prevent degradation.” **(Bham 2 v1)**

“The City of Bellingham has a 125 cfs instantaneous water right with a point of withdrawal on the Middle Fork Nooksack River. The diversion is managed to avoid flow depletion in the Middle Fork below the current instream flow low flow settings. Future management of the diversion will be based on instream flow and habitat effects to the Middle Fork and Mainstem Nooksack.” **(Bham 3 v1)**

8. Common interest in addressing the public education and information needs to best support efforts to protect water resources.

“Efforts need to be made to restore public trust so diking and drainage districts are seen as water protectors.” **(Dik3v1)**

“Public education and attitudes: What is currently known about WRIA 1 residents’ knowledge and attitude about water issues? Does current knowledge and attitudes aid, or stand in the way of, moving forward with science based solutions in WRIA 1?” **(Env13v1)**

Quality Issue/Problem Synopsis Statements – COMMON

1. Common interest in addressing impact on water quality of a variety of activities.

“What potential is there throughout the WRIA for catastrophic spills of hazardous materials (railroad derailments, pipeline leaks, tanker truck accidents, underground or above ground tank failures) that may significantly impact water quality?” **(Env 6 v2)**

“Given the current level of scientific understanding regarding global warming, if current trends continue what affects on water quality, quantity and habitat are likely to be seen in the next ten years?” **(Env 8 v2)**

“Alteration of natural stream flows has created a multitude of problems, resulting in negative impact.” **(Fis 2 v2)**

“How is open pit gravel mining impacting the water quantity (evaporation) and water quality (contamination) on aquifers and streams being considered?” **(PWO 2.9)**

“Sewage effluent is discharged directly to marine water bodies (i.e., Victoria, Birch Bay WSD, Lummi). To what extent is such discharge a factor in shellfish bed closures along the Whatcom County coast?” **(Sm Ci 1 v1)**

“The Washington State Department of Ecology has a list of 540 current and former tank sites in Whatcom County in its database. Any contaminated groundwater is an issue at many of these sites.” **(State 5 v1)**

“Cities must dispose of increasing quantities of bio-solids. Can land application at agronomic rates continue indefinitely?” **(SmCi 4 v1)**

“Use the best available science to make reliable estimates of the total maximum daily loading (TMDL) of contaminants throughout the WRIA to ensure that the water quality standards for the designated uses of each water body are achieved.” **(Lum4v1)**

“Conduct necessary data collection and analysis to estimate the TMDLs for fecal coliform (in progress), temperature, biochemical oxygen demand (BOD), sediment, and other water quality attributes of concern.” **(Lum14v1)**

“Water Quality Standards: Do water quality standards and parameters vary in other parts of the United States, and in other countries? Are their water quality standards in other areas for pollutants which we have no standards for here in WRIA 1? Provide a comparison of standards here in WRIA 1 with the most stringent standards from other areas, and provide an overview of the science that determined each. Are there standards here in WRIA 1 that are likely to change in the next twenty-five years, and if so, which ones? How can we anticipate and plan for changing, and additional water quality standards?” **(Env10v1)**

2. Common interest in addressing impacts on water quality of certain land use practices.

“The concern is that present land uses impact Lake Whatcom water quality.” **(Bhm 2 v1)**

“How will other land uses downstream or upstream of forestry designated areas be evaluated for impacts that occur outside the control of forestry designated areas, which are highly regulated by state and federal law?” **(For 1 v1)**

“How would a reduction in existing forestry lands impact habitat and needed water quality and quantity in the WRIA 1?” **(For 2 v2)**

“**SEDIMENTATION**What is the impact of forestry on sediments and what other activities are impacting them? What benefit would be gained if the Lummi River were to be opened up?” **(For 4 v2)**

“What is happening now, and what land uses could be identified for potential contamination, such as leaching due to fertilizer and pesticide applications, leaking gas storage and other pollution.” **(PWO 2.11)**

“Although the turbidity spikes are most often related to flood events, it is unknown to what extent land use activities are exacerbating the frequency or intensity of the spikes.” **(PUD 3 v2)**

“To meet GMA goals and objectives, Small Cities need more potable water. Alternative water supplies need to be addressed. Small cities need to know where they will go to meet future water needs. For example, if Lynden were to use Bellingham’s water right to help meet their resource needs, could the river be used as the conveyance mechanism?” **(Sm Ci 3 v1)**

“Specific issues for the small cities include...Sumas – siltation of the Sumas River (mass wasting on Swift Creek).” **(Sm Ci 4 v1)**

“Impact of Agricultural Land Conversion on Water Quantity and Quality Agricultural land is being converted to other types of land use. It is important to understand the true impacts of such conversions in terms of the short- and long-term implications for water use, water quality, fish habitat, and other factors. The range of potential impacts associated with the conversion should be considered in making the determination of whether to change zoning and approve subdivision of land” (State 10 v1)

“Impact of Impervious Surfaces on Hydrology As land is converted to impervious surfaces, runoff patterns change. While often addressed in terms of stormwater runoff, there is a need to evaluate the creation of impervious surfaces for their adverse impact on the underlying aquifers in terms of changes to recharge. In some cases, the reliability of water supplies for existing water rights using water from the aquifers overlain by impervious surfaces may be jeopardized.” (State 11 v1)

“Use the best available science to make reliable estimates of the total amount of available water in the WRIA (undepleted condition).” (Lum 1v1)

“Evaluate the accuracy of existing land use/ land cover data; collect additional land use/ land cover data if necessary.” (Lum7v1)

3. Common concerns about the impact of agricultural practices on water quality – e.g. nitrates, fecal coliform, and pesticides, etc.

“Water quality problems are perceived to involve nitrate issues – management of manure and other waste, pollution from pesticides.” (Ag 3 v2)

“Agriculture pesticides: The use of residential and agricultural pesticides in the county may be having a negative affect on the biota in the watershed.” (Env 1 v2)

“Nitrate has been identified as a particular concern related to groundwater and domestic water supplies in the northern County; Other parameters of note for domestic water supplies include arsenic, fecal coliform, saltwater (relic and intrusion), pesticides/VOCs and iron/manganese. Many surface waterbodies in the WRIA have been placed on the 303d list for parameters such as sediment, nutrients, temperature, coliform, and oxygen.” (WC 2 v1)

“Streams flowing through Cities are impaired, thereby preventing some beneficial uses (swimming). To what extent are impairments caused by City factors, as compared to rural factors? How much should Cities do to cure impairments? Specific issues for small cities include...Sumas – nitrate threats to potable water supplies, jurisdictional/cross-border issues complicate the ground water and nitrate issues.” (Sm Ci 4v1)

4. Common interest in addressing impacts on water quality of stormwater runoff.

“Storm Water: According to the U.S. EPA non-point urban stormwater runoff is now one of the major contributors to surface water quality problems in the United States. Alternatives are sought on how to lessen the impacts of stormwater runoff from the cities in the watershed, while at the same time recognizing the financial limitations of these governments.” (Env 2 v2)

“Stormwater management guidelines grow increasingly strict. How should Small Cities respond? Stream and wetland protective guidelines grow increasingly strict (i.e., wider buffers, natural buffers). How should Small Cities respond? Streams flowing through Cities are impaired, thereby preventing some beneficial uses (swimming). To what extent are impairments caused by City factors, as compared to rural factors? How much should Cities do to cure impairments? Cities must dispose of increasing quantities of street sweeping and storm

drain waste. Increasing amounts of herbicides, pesticides, and pet waste are applied to land within Cities. Is there significant impact upon surface or groundwater quality? Specific issues for the small cities include: fecal levels in Johnson, Fishtrap, and other creeks that are prohibiting recreateional use of the creeks; graoun water quantity issues; lack of instream strucutres and vegetative cover on stream sections going through town.” (Sm Ci 4 v1)

“The concern is that present land uses impact Lake Whatcom water quality. Public ownership and/or control will improve water quality or prevent degradation.” (Bham 2v1)

“Drainage ditches need to be maintained in a clean and open condition so productive farmland can continue to be productive and allow manure to decompose aerobically resulting in less pollution.” (Dik1v1)

“Operation of diking and drainage districts should utilize best management practice.” (Dik1.5v1)

“Districts need to be able to perform maintenance of diking and drainage systems in a timely, cost-effective and legal way; permitting needs to be possible in a timely fashion.” (Dik1.4v1)

“If buffers are established along the ditches and revegetated with trees, ability to access ditch for cleaning may be impaired.” (Dik1.6v1)

5. Common interest in addressing potential need for water treatment.

“What is the potential for a cryptosporidium outbreak due to using Lake Whatcom as a drinking water source now and in the future. What is the cost of treatment to prevent such a problem?” (Env 3 v2)

“...There is not an established comprehensive long-term monitoring program in place to collect the type of data needed by water purveyors and other decision-makers to assess source water quality trends over time for purposes of decision-making related to future water system needs. Future needs may include evaluating various water filtration and treatment options as well as identifying source protection measures and practices.” (PUD 4 v2)

“Water treatment: What would the cost and benefit of cities and industries moving to tertiary treatment of waste water? Could such water be reused to help reduce the amount of water withdrawals?” (Env12v1)

6. Common interest in addressing the public education and information needs to best support efforts to protect water resources.

“Efforts need to be made to restore public trust so diking and drainage districts are seen as water protectors.” (Dik3v1)

“Public education and attitudes: What is currently known about WRIA 1 residents’ knowledge and attitude about water issues? Does current knowledge and attitudes aid, or stand in the way of, moving forward with science based solutions in WRIA 1?” (Env13v1)

Quality Issue/Problem Synopsis Statements – POTENTIALLY OPPOSING

1. Potentially divergent perspectives on the cause of water quality problems.

“One perceived source of the problem is agriculture-related activity. Water quality problems are perceived to involve nitrate issues – management of manure and other waste, pollution from pesticides. There is a perception that problems are related to water quality – drinking, health of streams. This is not the Caucus’s perception – the Caucus feels this is the public perception.” (Ag 3 v2)

“Agriculture pesticides: The use of residential and agricultural pesticides in the county may be having a negative affect on the biota in the watershed.” (Env 1 v2)

“Forest lands have higher standard (State Law). It means that there is a lack of consistent standards, for example a stream segment that passes through agriculture then through forestry, then through agriculture and then through residential areas may have varying requirements for buffer zones through each area)” (For 1 v1)

“Whatcom County's 220 dairy farms do not consistently use Best Management Practices (BMP's) contained within Dairy Nutrient Management Plans (DNMP's) and, as a result, cause surface and/or groundwater pollution. Pollution of Washington State's waters by Whatcom County's dairy farms creates negative impacts to both private and public owned natural resources. These negative impacts include, but are not limited to: higher tax burdens for Washington's citizens and increased environmental degradation that threatens public health or the physical, chemical or biological health of aquatic ecosystems, including groundwater aquifers.” (State 1 v1)

“In addition to the dairy farms located in Whatcom County, other types of agricultural land use also have negative environmental effects. Raspberry farms, blueberry farms, potato farms and small farms with beef cattle or horses comprise a majority of this agricultural land use within Whatcom County.” (State 2 v1)

“Whatcom County's agricultural landowners do not consistently use Best Management Practices (BMP's) contained within Farm Plans (FP's) and, as a result, cause surface and/or groundwater pollution.” (State 4 v1)

Quantity Issue/Problem Synopsis Statements – COMMON

1. Common interest in determinig the legal availability of water.

“Currently, many WRIA 1 drainages are closed to further water withdrawals due to perceived over-appropriation and/or failure to meet instream flows. The perception of over-appropriation and failure to meet instream flows results from actions by the state to close basins regardless of whether there is agreement on the information used to close the basins. The perception is a general one that is generated by the fact that because the state took the actions, the resource must therefore be over appropriated.” (NMWS 1 v1)

“Currently, many WRIA 1 drainages are closed to further water withdrawals due to perceived over-appropriation and/or failure to meet instream flows. This condition has led to increased reliance upon exempt wells and non-permitted water use, as well as stunted economic growth.” (NMWS 4 v1)

“Preservation of water rights, wells are a part of property rights 2. All existing exempt wells declared irrevocable water rights, desire for grandfathering in existing water rights, Wells after 1986 not to be affected by instream flows 3. Treaty rights should not affect private wells” (PWO 2.1)

“Exemption may not consider rural use, exemption amount raised for small farms and nursery.” (PWO 2.2)

“Concern that people would be forced by regulations to public systems from their current private well status.” **(PWO 2.3)**

“Unregistered wells, clarify where they fall in this planning process, and note that they have no rights currently, with consideration for those that were done prior to Ecology process.” **(PWO 2.4)**

“How does this process determine what my use can be in the future (acreage and or agriculture)?” **(PWO 2.8)**

“Control of property rights through water rights” **(PWO 2.15)**

“Lack of water rights decisions by the State. This is in part due to lack of funding by the State legislature to provide for assessment, regulation and enforcement. The conflicting and unclear case law and state policy contributes significantly to this situation.” **(PUD 1 v2)**

“The legal availability of water is unknown. The determination of legal availability is dependent on knowledge of the physical availability of water. Water rights have been spatially mapped.” **(PUD 8 v2)**

“Evaluation of proposals in terms of potential impacts on existing water rights.” **(State 7 v1)**

“In evaluating a proposed water right change, Ecology must first determine the nature and extent of the right being changed i.e. what is the perfected water right that has been put to beneficial use. The ability to evaluate proposed changes to water rights in terms of the effect of the change on other water uses, including adopted instream flows, would be a valuable tool in WRIA #1.” **(State 9 v1)**

“...Many exempt withdrawals are initiated every year with little consideration of the impacts, including cumulative impacts, of such withdrawals on senior water right holders, instream flows established by rule in 1986, or long-term effects on the source aquifer in terms of either water quantity (sustainable yield) or quality (for example, seawater intrusion in coastal areas).” **(State 12 v1)**

“Uncertainty re: water availability for water right permit decisions throughout much of the WRIA There are a significant number of water users in WRIA #1 who do not have valid water rights for the water they use.” **(State 13 v1)**

“There are insufficient legally approved supplies of water to meet many current and future consumptive uses.” **(WC 1 v1)**

“Biggest concern is obtaining water rights for future demands.” **(Sm Ci 4 v1)**

“Estimate the most senior instream and out-of-stream water rights in the WRIA.” **(Lum11v1)**

“Estimate the next most senior water rights in turn based on the priority date of existing water right holders.” **(Lum12v1)**

“Estimate the amount of water remaining and thus available for allocation to new appropriators.” **(Lum13v1)**

“Non-municipal water systems want the same privilege that municipal water systems have – an exclusion from the ‘use it or lose it’ provision, so that their usage rates can fluctuate without risk of loss.” **(NMWS 5v1)**

“Non-municipal water systems that are using all of their water right want access to more water, to serve lots within their service areas.” **(NMWS 6v1)**

2. Common interest in determining and addressing the impact on water quantity of a variety of activities.

“There is a concern about how reductions of the diversion flow will reduce the quantity of water available for municipal purposes, in-stream flow for Whatcom Creek, and Lake Whatcom level control; and also how it may impact water quality in Lake Whatcom and Whatcom Creek.” **(Bhm 1 v1)**

“How will other land uses downstream or upstream of forestry designated areas be evaluated for impacts that occur outside the control of forestry designated areas, which are highly regulated by state and federal law?” **(For 1 v1)**

“How would a reduction in existing forestry lands impact habitat and needed water quality and quantity in the WRIA 1?” **(For 2 v2)**

“Proposed actions should not make people upstream provide for downstream uses.” **(PWO 2.7)**

“Impact of instream gravel mining on streams need to be considered.” **(PWO 2.9)**

“Clarification of environmental factors, naturally occurring, that could restrict flow, as well as man-made factors, that can affect it. Are we considering all the factors? How will these be factored into the equations?” **(PWO 2.10)**

“Impact of Agricultural Land Conversion on Water Quantity and Quality Agricultural land is being converted to other types of land use.” **(State 10 v1)**

“Impact of Impervious Surfaces on Hydrology Ag land is converted to impervious surfaces, runoff patterns change. While often addressed in terms of stormwater runoff, there is a need to evaluate the creation of impervious surfaces for their adverse impact on the underlying aquifers in terms of changes to recharge.” **(State 11 v1)**

“To meet GMA goals and objectives, Small Cities need more potable water. Alternative water supplies need to be addressed. Small cities need to know where they will go to meet future water needs. For example, if Lynden were to use Bellingham’s water right to help meet their resource needs, could the river be used as the conveyance mechanism?” **(SmCi 3 v1)**

“Existing watershed management plans: How many approved watershed plans exist in WRIA 1 (Drayton Harbor, Ten Mile Creek, Kamm Creek, Lake Whatcom, etc.)? Of those plans how many have met the implementation schedules for their action items? OF the plans how many have led to improvements in the targeted water quality parameters? If plans have not met the source control goals state in them what are the reasons for lack of success? What lessons from the successes and failures of these plans can be helpful for the WRIA 1 planning process?” **(Env9v1)**

3. Interest in developing a common definition of ‘hydraulic continuity’ and its application in a scientific understanding of water available in the basin.

“We ask that a science based definition for hydraulic continuity meaningful and relevant in applied science (i.e. what order of magnitude transfer of flow from one stream to another is relevant?).” **(LD 1.2)**

“Need technical support to drive information to the groundwater level of information in the basin. Recharge capability of differing areas and the hydraulic continuity between them.” (PWO 1 v1)

“How will the continuity between ground water and instream flow be assessed; there is a large variation in continuity from geographic area to area and variations by season.” (PWO 2.6)

“Lack of understanding regarding hydraulic continuity throughout WRIA 1. Lack of understanding by whom? Two distinct areas for lack of understanding-1) general public does not understanding hydraulic continuity 2) lack of technical data available to science community to determine the extent of hydraulic continuity.” (PUD 7 v2)

“Assurance of hydraulic continuity issue. Will increasing withdrawal from Everson’s Strand Road well influence surface water levels?” (Sm Ci 2 v1)

“Specific issues for the small cities include...Blaine – Ground water supply and how wells are going to be addressed in WRIA (how will Blaine’s aquifer be characterized?)” (Sm Ci 4 v1)

“It is an issue of how to ensure adequate water resources to the agriculture community If there is a problem, what time of year is there a problem? What can be done to mitigate or augment flows? What advantages can be gained by transferring from surface to groundwater, and vice versa? What is the rate and timing of the effect groundwater has on surface water? If water is taken out at a given distance from a stream what affect, if any, does it have? If there is an affect, what can be done to mitigate it?” (Ag 2v2)

4. Common interest in determining the feasibility of transferring from surface to groundwater and vice versa.

“If there is a problem, what time of year is there a problem? What can be done to mitigate or augment flows? What advantages can be gained by transferring from surface to groundwater, and vice versa? What is the rate and timing of the effect groundwater has on surface water? If water is taken out a given distance from a stream what affect, if any, does it have? If there is an affect what can be done to mitigate it?” (Ag 2 v2)

“Concerning the water budget, the Land Development Caucus wants to know to what extent peak flows may be available for groundwater recharge or above ground surface storage.” (LD 1.3)

“Aquifer Storage and Recovery (ASR) Synopsis: For each drainage with instream flow or other water supply constraints, can we store surface water in aquifers during the high flow periods, and then withdraw it during low flow periods, both to meet instream flows and provide additional water supplies for other needs?” (NMWS 1 v1)

“Off-Channel Storage (OCS) Synopsis: For each drainage with instream flow or other water supply constraints, can we store surface water in off-channel multi-purpose storage areas during the high flow periods, and then withdraw it during low flow periods, both to meet instream flows, augment aquatic habitat, mitigate flood impacts, and provide additional water supplies for other needs? To the extent that this condition is not improved by relinquishment of invalid paper water rights, it might be possible to side-channel surface water during high flow periods for both in situ uses as well as potential water supply and instream flow augmentation during low-flow periods?” (NMWS 4 v1)

“What are the spatial and temporal variations to surface water flow in the South Fork Nooksack River, the Main Stem and its tributaries that would result from withdrawing groundwater instead of diverting surface water?”

How would the surface water flows change with the removal of the tile drain systems throughout the lower Main Stem basin?” (Nook 3 v1)

“Another issue associated with withdrawal (both surface and ground water) is withdrawal from one area and it being discharged to an area outside of where it was withdrawn or consumed. How is this being accounted for in water use and availability quantification?” (Sm Ci 2 v1)

5. Common interest in determining the physical availability of water.

“Concerning actual water usage, Land Development Caucus wants a solid determination of water usage and future water usage based on all land uses in the existing comprehensive plans for all jurisdictions in the WRIA 1. In addition, the caucus requests that supply shortfalls be identified, explained, and options for dealing with these shortfalls be presented. “ (LD 1.4)

“Clarify the actual return use versus amount taken out; and assess the water contribution by private wells (through-flow). Clarify the determination of the net water loss by different user groups.” (PWO 1 v1)

“Consider the potential impact of small water users; clarification of actual return use versus amount taken out; and the water contribution by private wells should be assessed (through-flow).” (PWO 2.5)

“Physical availability of water is inadequately known. There is a lack of spatial, temporal information.” (PUD 2 v2)

“To meet GMA goals and objectives, Small Cities need more potable water. Alternative water supplies need to be addressed.” (Sm Ci 3 v1)

“The goal of the water quantity component is to assess water supply and use and to develop strategies to meet current and future needs. The strategies should retain or provide adequate amounts of water to protect and restore fish habitat, provide water for future out-of-stream uses and to ensure that adequate water supplies are available for agriculture, energy production, and population and economic growth under the requirements of the state’s growth management act. (Source – March 27, 2000 Adopted Scope of Work).” (WC 1 v1)

“Use the best available science to make reliable estimates of the total amount of available water in the WRIA (undepleted condition).” (Lum 1v1)

“Use the best available science to make reliable estimate of the tribal water rights for both instream and out-of-stream uses.” (Lum2v1)

“Use the best available science to make reliable estimates of the amount of water available for allocation to junior users and for further appropriation.” (Lum3v1)

“Evaluate the accuracy of existing land use/ land cover data; collect additional land use/ land cover data if necessary.” (Lum7v1)

6. Common interest in taking economic considerations into account in addressing water quantity issues.

“Care should be taken to stop actions at the point in which additional expenditures and actions result in very little improvement (marginal returns). Economic, environmental, and social issues should be considered.” (Ag 1 v2)

“For all options and all proposals that are included in the studies, modeling, and the watershed management plan itself, Land Development Caucus requests that a cost/benefit analysis be included and expressed in quantitative terms, with particular emphasis on diminishing returns.” **(LD 1.7 v1)**

“Economics and Preservation of Lifestyle - Overpopulation: Concern about possible future costs attributed to private well owners and use of cost as a method to promote conservation.” **(PWO 2.27)**

“Flooding along Nooksack and overflow corridor creates extensive damage within Everson, Nooksack, Sumas, Lynden, Ferndale. Property loss from floods and high waters (loss of Riverside Park is an example).” **(SmCi 4 v1)**

“Maintenance of drainage ditches needs to be conducted on a timely basis so planting and harvesting can be done when necessary.” **(Dik1.2v1)**

“Districts need to be able to perform maintenance of diking and drainage systems in a timely, cost-effective and legal way; permitting needs to be possible in a timely fashion.” **(Dik1.4v1)**

“Permitting process should be streamlined; ideally, one application should be used for all permits, facilitate the process should be facilitated by a single location or agency.” **(Dik1.7v1)**

“Drainage districts may not have the authority to do things mandated by permit requirements (e.g. planting on private property).” **(Dik1.8v1)**

“Allocation of water resources and water rights should be fair and equitable.” **(Dik2v1)**

7. Common perspective that agriculture is an important part of the community.

“There is a feeling that the agricultural community needs to be viewed with the same support and respect as other industrial interests.” **(Ag 2 v2)**

“...Each of these agricultural activities provides some economic benefit to the local economy of Whatcom County, although work done by WWU economists during the Nooksack Watershed Initiative indicated that Whatcom County agriculture employed less than 4% of the workforce of Whatcom County (not counting approximately 2,000 seasonal hires). Nevertheless, agricultural activities play a significant and valued role in Whatcom County in terms of the economic well-being of individuals engaged in agricultural practices, in the overall value to the County in terms of the economy, and in the quality of life in a watershed with significant amounts of open space and pastoral views.” **(State 13 v1)**

Quantity Issue/Problem Synopsis Statements – POTENTIALLY OPPOSING

1. Potentially opposing interest regarding the value and impact of agriculture.

“It is an issue of how to ensure adequate water resources to the agriculture community – at least until the point that it’s fully paved over... The term “fully paved over” refers to the potential loss of ag land to development, or loss due to regulatory issues making farming untenable.” **(Ag 2 v2)**

“Impact of Agricultural Land Conversion on Water Quantity and Quality Agricultural land is being converted to other types of land use. It is important to understand the true impacts of such conversions in terms of the short- and long-term implications for water use, water quality, fish habitat, and other factors. For example, conversion

to non-agricultural use could result in less pollution due to manure application or other contributions to nitrate in ground waters.” (State 10 v1)

2. Potentially opposing interests regarding the appropriate criteria for assessing water quantity.

“Appropriate levels means whatever level is necessary to support the diverse fish species and lifestage needs.” (Fis 2 v2)

“Balance Needs· Instream vs. out-of-stream water uses· Unrealistic expectations to rehabilitat (fish) the basin · Fish versus people.” (PWO 2.22)