**TABLE 2-1**

**Water Resource Management Strategy Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| ***Proposed Water Resource Management Strategy and Adaptive Management*** | |
| **WRMS-1**: Recommends that the State Department of Ecology adopt, in rule, the new water resource management strategy for WRIA 45, including the management flows (revised instream flows) at specified control points, the water reserve, and maximum allocations. The management flows, water reserve and maximum allocation are outlined in more detail in Sections 4.4 through 4.6. | Ecology |
| **WRMS-2**: Recommends that the Planning Unit or future implementing body in WRIA 45 be involved with Ecology, in any scoping, study planning, study implementation, alternatives analysis, negotiations or rule development if Ecology undertakes instream flow or related water management studies or rulemaking in the watershed. | Ecology, WWPU |
| **WRMS-3**: The WWPU with Chelan County taking the lead role will participate in the development and implementation of an adaptive management process to support this water resource management strategy. The process should address flexibility in the distribution of the reserve across the WRIA. The details of the adaptive management process will be determined as part of Phase IV Implementation. | Chelan County, WWPU |
| **WRMS-4**: Implementation of a new or existing instream flow rule in the Wenatchee Watershed will require that flow monitoring continues at all existing and proposed control points on the Wenatchee River and its tributaries. Figure 4-1 shows the locations of all control points and active stream gages in the watershed. The following actions address these requirements. The WWPU: | |
| **WRMS-4a**: Recommends that Ecology continue to support monitoring at all existing stream gages in the Wenatchee Watershed. Ecology and partners must ensure that the gages and streamflow data are well maintained. Updated data should be made available on the Ecology website in a timely manner for all gages managed by Ecology. | Ecology |
| **WRMS-4b**: Encourages the USGS to continue to maintain USGS gages in the watershed to support implementation of this water resource management strategy. | USGS |
| **WRMS-4c**: Recommends a new stream gage be established at the existing control point on the Icicle Creek. Details will be determined during Phase IV, Implementation. | Ecology |
| **WRMS-4d**: Review the gage location on the Chiwawa River as related to the impacts on flows from withdrawals. | |

**TABLE 2-2**

## Water Quantity Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Water Rights, Trusts and Bank*** | |
| **QUANT-1**: Develop recommendations for Ecology regarding the processing of new water right applications and applications for water right changes and transfers in WRIA 45. Create the recommendations through a collaborative approach between the Planning Unit and the Chelan County Water Conservancy Board, and base them on knowledge of water availability, allocation and flows; consistent with the proposed instream flow rule and resulting reservation and maximum allocation requirements for sub-watersheds. Recommendations may include data requirements necessary to evaluate the impacts of an application on surface and groundwater, areas of concern, policy regarding changes and transfers (may link to land use conversions or incentives for agricultural preservation). Recommendations should also consider facilitation of water right transfers or changes that will result in new water for a reservation in flow impaired sub-watersheds such as Mission and Chumstick Creeks. | WWPU and Chelan Water Conservancy Board |
| **QUANT-2**: Request additional Ecology staff time from the legislature to process WRIA 45 water rights. (Focus may be transfers or new applications). | Ecology |
| **QUANT-3**: Ecology should enforce existing regulations and policies concerning water rights and use. | Ecology |
| **QUANT-4**: Provide incentives for conserving water rather than using it to avoid losing it. Encourage efficiencies through current water law using tools such as water trusts and/or other innovative techniques. Consider the Irrigation Efficiencies Program, and other incentives programs offered by the state and other entities. Criteria for participation include a demonstration of financial need and environmental benefit, a minimum 10 year lease of the conserved water to the Trust Water Program, and the public investment in the project not exceeding 85% of the total cost. In general, the state offers financial programs and incentives to conserve when there is a public benefit. In many cases, dedication of the conserved water to instream flows has been the legislature's preferred means of securing the public benefit. | Chelan County, Irrigation Districts, Canal Companies, other Agriculture. Assistance by Ecology |
| **QUANT-5**: Consider Ecology's Trust Water Program as an option to temporarily safeguard water rights during times of non-use or reduced use while satisfying the needs of beneficial uses in the watershed. Develop strategies for using trust water to safeguard water that may be used in the future to support a more water-intensive crop type or conversion from agriculture to residential. Use of this program is consistent with the proposed water resource management strategy as described in Section 4.0. | Chelan County, Irrigation Districts, Canal Companies, other Agriculture. Assistance by Ecology |
| **QUANT-6**: Develop an administrative structure for a water bank for WRIA 45. Section 5.1.3 introduces water banks; however, the details of the administration of a water bank in WRIA 45 will be determined in Phase IV, Implementation. | WWPU, Chelan County |
| **QUANT-7**: Chelan County or other entity with agency funding assistance will investigate water rights for purchase or lease in WRIA 45. The County will seek funding from Washington Water Trust, Washington Rivers Conservancy, BPA, USBOR, NPCC, Ecology and others. Water rights that are purchased or leased can be used to extend the water reservation while adhering to a "no net impacts" standard. | Chelan County, funding Entities could include: BPA, WWT, WRC, BOR, NPCC, Ecology, others |

**TABLE 2-2**

## Water Quantity Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Tracking Water Availability and Use*** | |
| **QUANT-8**: Chelan County Natural Resource Department will develop and administer a monitoring program to assess actual domestic water use to verify the 380 gpd per household assumption used to debit the reservation and to adjust the amount of water remaining in the reservation at five year intervals, or more frequently if the number of wells drilled or building permits granted indicate that growth is occurring more rapidly than projected in any sub-watershed. These assessments will be conducted based on a statistical sample of new domestic water users (single domestic, group domestic and municipal water use and associated lawn and garden irrigation (some with separate irrigation, some without), some with stock, etc.). Metering data will be incorporated into the water use audit and the accounting system. See the recommended action in the Plan for more details. | CCNRD |
| **QUANT-9**: Reservation accounting will include the tracking of new exempt wells by Chelan County through the building permit process, septic approval through the Chelan-Douglas Health District (CDHD), tracking new domestic and municipal water rights granted by Ecology and tracking well drilling permits as issued by Ecology. The mechanism for tracking the permitted uses will be determined as part of Phase IV, Implementation. Chelan County is currently developing a method for tracking new permit-exempt wells in WRIA 46. This should also be considered for WRIA 45. | CCNRD |
| **QUANT-9a**: Chelan County Natural Resource Department will track new exempt wells through the building permit process and will coordinate with the CDHD. A joint city/county process will need to be implemented to assist the county in tracking any building permits requiring exempt wells that are issued by other cities (if applicable) within the watershed. | CCNRD, CDHD, and possibly cities |
| **QUANT-9b**: New rights that are granted by Ecology for domestic water uses will be tracked by CCNRD. The mechanism for tracking the new permitted uses that will debit the reserve will be determined as part of Phase IV, Implementation. | CCNRD, Ecology |
| **QUANT-9c**: Long-term funding for tracking is required. | CCNRD and potential funding agencies |
| **QUANT-10**: The Planning Unit recommends metering be required for all new uses eligible under the reserve. The Planning Unit will further define responsible entities, and staffing, budget and funding considerations of the metering program as part of Phase IV, Implementation. Chelan County, CDHD, Ecology, utilities, and others will work together to structure the program. The following should be addressed as part of phase IV:<br>• Identify responsible entities, and address staffing, cost and funding concerns<br>• Consider implementation by an existing utility with an existing metering program<br>• Consider having water users read their own meters<br>• Consider use of Ecology's water measuring system and database<br>• Consider metering options for existing water users and development of a voluntary program that uses existing metering programs' available meters. | WWPU |

**TABLE 2-2**

**Water Quantity Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| ***Exempt Wells*** | |
| **QUANT-11**: Undertake hydrogeologic studies to assess the influence of groundwater withdrawals on surface water. Identify funding for this study and responsible parties (WWPU to identify sub-areas for study, responsible entity as part of Phase IV, Implementation). | CCNRD |
| **QUANT-12**: Funding should be requested to survey (using GPS) private wells. The CDHD should investigate collaborating with Ecology to include these new data in the water well report log database. Recommend that the county, health district, and Ecology work together to identify, log and provide oversight of exempt wells. As part of this oversight responsibility, the CDHD should work with DOH to survey wells with greater than 3 connections. Chelan County has already conducted a GPS survey and evaluation of Group A systems (> than 14 connections). | CDHD, Chelan County with Ecology |
| **QUANT-13**: Provide public education as to the roles, responsibilities and regulations pertinent to exempt wells, and encourage the proper entities to enforce/implement (CDHD, DOH, Ecology, County). | CDHD, DOH, Ecology, County |
| **QUANT-14**: Credit a water service provider for abandoned and/or decommissioned exempt wells. This action will be further developed in Phase IV, Implementation. The well consolidation process is addressed in RCW 90.44.105. This statute presumes a credit of 800 gpd/well unless an alternative minimum is established by Ecology in consultation with DOH or there is credible evidence of non-use. | Ecology, Chelan County, Water Systems |
| ***Conservation and Efficiency*** | |
| **QUANT-15**: As part of Phase IV, Implementation, Chelan County and cities should develop policies that can be used to ensure efficient use of water in the event of a land division or new development. These include: | Chelan County, cities |
| **QUANT-15a**: For land division applications that have shares in an irrigation district, develop policies requiring that the developer provide tie-ins to the irrigation box; ensure easements; deliver water to parcels, where practicable; and form a Homeowners Association for residential uses. Encourage Irrigation Districts to work with the county and cities to extend infrastructure and irrigation water service where practicable. | Chelan County, cities |
| **QUANT-15b**: For land division applications on property with individual water rights, Chelan County should develop policies that encourage the developer to provide residential tie-ins to the water source for residential irrigation purposes. | Chelan County |
| **QUANT-15c**: Encourage cities and Chelan County to develop policies that encourage conservation measures for outdoor water use as a condition of subdivision approval (eg., drought tolerant landscaping, maximum lawn size, stormwater collection systems, residential irrigation system installation). Encourage use of small scale storage, rain barrels, for outdoor irrigation. | Chelan County, cities |
| **QUANT-15d**: Encourage cities to develop policy statements that address transfer of water rights from private water right holders in the event of a land use conversion. For example, the City of Cashmere has policies in place that require water rights to be transferred to the City upon land division/service provision by the City's system. This policy helps preserve the City's ability to serve future users within the UGA with water. | Cities |

**TABLE 2-2**

**Water Quantity Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **QUANT-15e**: Provide public information that encourages actions QUANT-15a through QUANT-15d, and explains the benefits (provide this information during subdivision application or preliminary plat comment period). | Chelan County, cities, other water purveyors, also CDHD |
| **QUANT-15f**: Encourage cluster development, and group domestic over single domestic systems to increase water use efficiency. Explore encouraging group domestic over single domestic use as part of the approval process for land division applications. Further develop this recommendation as part of Phase IV, Implementation. | Chelan County, cities |
| **QUANT-16**: Research how different entities in the watershed are implementing conservation measures and acknowledge current efforts. [Note that Leavenworth is metering and employs a rate and fee structure that encourages conservation. Cashmere is currently working on revising their rate structure such that there will be more incentive for conservation.] Encourage additional conservation measures where needed. Encourage incentive based solutions. These may include QUANT-16a through QUANT-16d. | |
| ***Conservation and Efficiency: Residential, Industrial and Commercial (Public Water System and exempt wells)*** | |
| **QUANT-16a**: Encourage cities and other water providers to implement a rate and fee structure that promotes conservation (similar to Leavenworth's current program and Cashmere's proposed program). | Chelan County, cities, water purveyors |
| ***Conservation and Efficiency: Irrigation (Districts and Canal Companies)*** | |
| **QUANT-16b**: Encourage funding to line canals or implement other delivery system improvements, where appropriate. | Chelan County, Irrigation Districts, Canal Companies, other Agriculture. Assistance by Ecology |
| **QUANT-16c**: Encourage the use of reclaimed water (tertiary treatment) for outdoor irrigation, industrial, and commercial use (see Ecology Watershed Guidance). | |
| **QUANT-16d**: As part of Phase IV, Implementation, convene a forum to investigate conservation strategies and how they could be implemented by irrigation districts, ditches and other private companies. Involve utilities, cities, Chelan County and Ecology when appropriate. There is a need to work with members of irrigation districts, ditches and others to determine ways to save water and ensure that water rights are protected into the future. Items of discussion could include alternative rate structures based on purpose of water use; partnerships with cities and utilities; utility coordination during development; tools to conserve water, improve instream flows and protect water rights at the same time; and distribution of public education materials. | Chelan County, Irrigation Districts, Canal Companies, other Agriculture, cities, PUD. Ecology, others |
| ***Conservation and Efficiency: On-Farm Efficiencies*** | |
| **QUANT-17:** Encourage on-farm efficiencies and implementation of Best Management Practices (BMPs) to encourage water conservation. | Chelan County |

**TABLE 2-2**

**Water Quantity Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **QUANT-18:** Encourage the County to provide information and education about water conservation options and fire planning; including: outdoor watering, timing, types of native vegetation that require low water use, lawn size, low flow fixtures, etc. to the new land user. The Municipal Water Law requires that water systems provide education and outreach regarding water conservation. However, water users that are using irrigation ditch water for outdoor use and/or exempt wells will not receive this information. Irrigation systems may also be able to provide materials in monthly billings. The details of this educational program will be determined during Phase IV, Implementation. Realtors should be encouraged to distribute public education materials describing water conservation and efficient water management techniques. | Chelan County |
| ***Storage Opportunities*** | |
| **QUANT-19**: Consider funding storage options from the Storage Assessment. See relevant sub-watershed sections (Section 9.0) for specific storage opportunities as listed in the WRIA 45 Storage Assessment Report. | |
| ***Projects and Studies*** | |
| **QUANT-20**: CCNRD or other entities to administer studies on water resources throughout the watershed, especially in areas where inadequate data exist to make decisions regarding future water use (eg., Chumstick, Northside Tributaries). | CCNRD, other entities |
| **QUANT-20a**: Water budgets have been prepared by sub-watershed. These budgets indicate total water use by use type (eg., residential, industrial, commercial, agricultural, fish propagation), but do not provide estimates of consumptive use. A consumptive crop irrigation requirement is presented. Further this study by defining the consumptive portion of the water use in the water budgets. Incorporate water usage rates with varying efficiencies for each water use type. Use this information to develop appropriate and useful water use efficiency requirements on lands that have been converted from agricultural to residential. | |
| **QUANT-20b**: Study groundwater in specific areas of the watershed (eg., Mission Creek, Lower Chumstick/Eagle Creek area, Monitor area). Finalize the areas for study as part of Phase IV, Implementation. | |
| **QUANT-20c**: There is a need to better understand the groundwater – surface water interaction in the watershed. Formalize studies to address this issue. | |
| **QUANT-21**: Evaluate the consumptive portion of reserved water uses and determine if recharge credit should be included in the accounting of the reservation. | |
| **QUANT-11**: Undertake hydrogeologic studies to assess the influence of groundwater withdrawals on surface water. Identify funding for this study and responsible parties (WWPU to identify sub-areas for study, responsible entity as part of Phase IV, Implementation). | |
| **ChumQUANT-2**: Chumstick Water Forum to assist in developing a data collection plan to monitor surface water flows (specify location) and develop management flows. | |

**TABLE 2-2**

**Water Quantity Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **ChumQUANT-3**: Chumstick Water Forum, with assistance from Chelan County and Ecology, to conduct groundwater monitoring to understand hydraulic continuity and overall impact of exempt wells on groundwater levels and streamflows. | Chumstick Water Forum with assistance from Chelan County and Ecology |
| **ChumQUANT-6**: A cumulative impact analysis of permit exempt use and uses associated with permits and claims approved since 1983 will be initiated by Ecology as authorized under the 1983 flow rule. Chelan County will partner with Ecology in this study. The cumulative impacts assessment will help to determine whether Ecology will curtail outdoor domestic water use of wells installed after 1983, and whether Ecology will close the Chumstick Sub-watershed to outdoor water use in the future. | |
| **ChumQUANT-7:** Chumstick Forum, Chelan County and Ecology to re-evaluate a proposed strategy for the Chumstick in three years after rule adoption, when new monitoring data have been collected and assessed and cumulative impact analysis is complete. Consider allowing group domestic groundwater use of deeper aquifer only as part of the Chumstick strategy addressed by the Forum. | |
| **NSTQUANT-1**: Future water supply availability should be discussed with Chelan County Public Utility District (PUD) to determine whether they have the capacity and infrastructure to provide backup supply. The East Bank Aquifer Regional Water Supply will only be considered as a source of water for this area if approved by the owners of the Regional Water Supply. | |
| **QUANT-8**: Chelan County Natural Resource Department will develop and administer a monitoring program to assess actual domestic water use to verify the 380 gpd per household assumption used to debit the reservation and to adjust the amount of water remaining in the reservation at five year intervals, or more frequently if the number of wells drilled or building permits granted indicate that growth is occurring more rapidly than projected in any sub-watershed. These assessments will be conducted based on a statistical sample of new domestic water users (single domestic, group domestic and municipal water use and associated lawn and garden irrigation (some with separate irrigation, some without), some with stock, etc.). Metering data will be incorporated into the water use audit and the accounting system. See the recommended action in the Plan for more details. | CCNRD |

**TABLE 2-3**

## Growth and Land Use Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Integrating Water Availability in Land Management Decisions (Water for Growth/Land Use)*** | |
| **GLU-1**: As part of reservation accounting, establish a resource base for decision-makers to use to consider technical water resource information when making land use change decisions and when considering land use permit applications. This should include:<br><br>**GLU-1a**: Chelan County Natural Resource Department (CCNRD) will provide technical input regarding the reservation and eligible uses into the decision making process for consideration by city and county land use decision makers.<br><br>**GLU-1b**: Water resource and supply related data for the watershed will be maintained in a database by CCNRD (eg., a water supply dataset including water system boundaries, an exempt well tracking system, on-going tally of water rights and water use per water system, instream flow and groundwater level data, an assessment of whether current water rights can service full build-out based on current zoning, etc.). CCNRD would update this information as a larger population is served in the future and ensure the information is available in a format that is easily understood by the public. | CCNRD |
| **GLU-2**: As part of Chelan County's zone change process, water supply and water resource information is available for use from CCNRD. | CCNRD |
| **GLU-3**: As there is urban growth in the WRIA, ensure that water availability is considered in UGA boundary decisions for existing and new UGAs. For proposed Urban Growth Area boundary expansions that are outside the jurisdiction of an existing water service area, the proposal for expansion should include documentation of a water purveyor's intention to provide water, their ability to provide water, or the ability of the development to provide water if it is to be self-served. | Cashmere, Leavenworth, Wenatchee, CCNRD |
| ***Consistency between Critical Area Ordinance and WRIA 45 Watershed Plan*** | |
| **GLU-4**: The Wenatchee Watershed Planning Unit is supportive of the goals and intent of the GMA to provide critical area protections, as these are consistent with water quality, quantity and habitat goals of the Wenatchee Watershed Plan and the Watershed Planning Act. The Planning Unit further supports the efforts of local jurisdictions to implement non-regulatory programs that protect critical areas and is interested in exploring potential partnerships in these efforts. | WWPU |
| **GLU-5**: Data, protection measures and strategies relating to critical area protections should be documented as part of the watershed planning process. Encourage local jurisdictions to utilize the data, protection measures and strategies identified in the 2514 Wenatchee Watershed Plan in the development and update of critical area protections under GMA. Ensure that this information is readily available to local jurisdictions. | CCNRD |

**TABLE 2-3**

## Growth and Land Use Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| **GLU-6**: The protection measures and strategies identified in the 2514 Watershed Plan should be considered by local governments as non-regulatory mechanisms to protect critical areas watershed wide. These approaches include:<br>• Land protection measures such as easements, leases, purchases and other creative measures, such as transfer of development rights to protect remaining floodplain and riparian habitat<br>• Wetland restoration<br>• Fish passage improvements; removal of fish passage barriers<br>• Restore channel function<br>• Reconnect disconnected habitat areas<br>• Restore floodplain function<br>• Maintain forest roads<br>• Control and eradicate noxious weeds | Local Governments |

**TABLE 2-4**

## Water Quality Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Temperature, Fecal Coliform, pH/DO, and DDT*** | |
| **QUAL-1**: Chelan County Conservation District (CCCD) should continue to oversee and implement recommendations in the Watershed Action Plan, ensure other entities are also implementing voluntary actions in the Watershed Action Plan, and encourage continued funding of these efforts. | CCCD |
| **QUAL-2**: Ecology should continue to work with the local watershed planning group through both implementation of the current TMDL, and on future TMDLs if further listings arise. | Ecology and WWPU |
| **QUAL-3**: Ecology should continue to work with the local watershed planning group for funding future projects. | Ecology |
| **QUAL-4**: Encourage the Wenatchee Watershed Planning Unit and its other subcommittees (Water Quantity, Instream Flow, Habitat, and Growth and Land Use) to use the information in the TMDL Technical Reports and SISs along with their conclusions, recommendations, and actions for a more holistic approach to restoration, preservation, and enhancement of the watershed for all beneficial uses (WQTS, 2006a; WQTS, 2006b; WQTS, 2006c; WQTS, 2006d). | WWPU, WQTS, Water Quantity Subcommittee, Instream Flow Subcommittee, Habitat Subcommittee, and Growth and Land Use Subcommittee |
| ***Temperature*** | |
| **QUAL-5[a]:** Appropriate actions to be used in the appropriate location should be determined to address temperature exceedances in Phase IV, Implementation for all of the temperature-related recommendations in the Plan. | |
| **QUAL-6 [a]:** Actions to improve shade near surface waters should be implemented, where feasible. Shade management practices should involve the development of mature riparian vegetation. The WQTS should use the information provided in the temperature technical report and Planning Unit studies (FLIR, LIDAR, PHABSIM, etc.) to create a prioritized list of locations and plan for establishing riparian vegetation. Associated monitoring should be planned and implemented over time, as full riparian vegetation requires many years to become established. The upper watershed should be addressed first as it has the most potential for shade improvements and water temperature reductions. An evaluation of the 303(d) listed waters in the upper watershed should be conducted to see if they should be dropped from the 303(d) list due to natural conditions (Chiwaukum Creek, Little Wenatchee River). The WQTS should coordinate with the Planning Unit's other subcommittee conclusions, recommendations, and actions to reduce water temperatures (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |
| **QUAL-7 [a]:** For U.S Forest Service land, the riparian reserves prescriptions in the Northwest Forest Plan should be implemented for the establishment of mature riparian vegetation, where appropriate. The U.S. Forest Service should be the primary implementing agency. The WQTS and the Department of Ecology should coordinate with the U.S. Forest Service (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |

a = This recommended action *only* applies to the sub-watersheds that have a 2004 303(d) listing for temperature. See Figure 7-1.

**TABLE 2-4**

## Water Quality Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| **QUAL-8[a]:** For State and privately owned forest land, the riparian vegetation prescriptions in the Forests and Fish Report (Washington State Department of Natural Resources (DNR), 1999) should be implemented for all perennial streams. Load allocations are included in this TMDL for forest lands in accordance with the section of the Forests and Fish Report entitled "TMDLs produced prior to 2009 in mixed use watersheds." The WQTS and the Department of Ecology will coordinate with the Department of Natural Resources (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |
| **QUAL-9[a]:** For areas that are not managed in accordance with either the Forest Plan or the Forests and Fish Report, voluntary programs to increase and protect riparian vegetation should be developed, such as riparian buffers and conservation easements. The WQTS and the Department of Ecology should work with private forested landowners, agencies, and stakeholders to develop and monitor the projects (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |
| **QUAL-10[a]:** Stream temperature is related to the amount of instream flow, and increases in flow generally result in decreases in temperatures. The WQTS should work with the Planning Unit and watershed entities to encourage projects that have the potential to increase and protect surface and groundwater flows. Voluntary retirement, purchase, leasing of existing water rights, or other conservation methods to preserve and enhance instream flow should be encouraged. In addition, water storage opportunities that have the potential to increase instream flows during critical periods should be considered (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |
| **QUAL-11[a]:** Adaptive management activities to control potential channel widening processes should be encouraged. Reductions in channel width are expected as mature riparian vegetation is established. For example, activities that reduce sediment runoff to surface waters from upland and channel erosion can affect channel width and temperatures (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |
| **QUAL-12[a]:** Actions to improve hyporheic exchange flows and groundwater-surface water recharge should be identified and implemented to improve the current temperature regime and reduce maximum daily instream temperatures. Factors that influence hyporheic exchange flow include the vertical hydraulic gradient between surface and subsurface waters as well as the hydraulic conductivity of streambed sediments. Activities that reduce instream flows, hyporheic exchange and hydraulic conductivity of streambed sediments can increase stream temperatures, such as drilling of wells along streams and connected ground water reservoirs, and development in the flood plain. The WQTS should work with the Planning Unit and its subcommittees to identify and implement management activities designed to protect and enhance instream flow and subsurface water exchange with streams. Actions should be identified and implemented to reduce upland and channel erosion and avoid sedimentation of fine materials in the stream substrate (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |
| **QUAL-13[a]:** Ecology should continue existing temperature monitoring, and expand the current temperature monitoring program such that it is consistent with flow monitoring actions recommended in WRMS-4a and WRMS-4c. | |

a = This recommended action *only* applies to the sub-watersheds that have a 2004 303(d) listing for temperature. See Figure 7-1.

**TABLE 2-4**

## Water Quality Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| **QUAL-14[a]:** The WQTS should work with the Planning Unit in the development of proposed water storage, irrigation, habitat, and development projects to provide input regarding shade, riparian vegetation, and engineering to reduce water temperatures (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |
| **QUAL-15[a]:** To determine the effects of management strategies within the Wenatchee River Basin, regular monitoring is recommended. Continuously-recording water temperature monitors should be deployed from July through August to capture the critical conditions. The following locations should be targeted for a minimal sampling program: Wenatchee River near mouth, Icicle Creek near mouth, Nason Creek near mouth, Peshastin Creek near mouth, and Mission Creek near mouth. Monitoring will be conducted associated with BMPs to track progress toward shade and water quality targets. Water temperature monitoring should be conducted and coordinated with associated BMP projects over time (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |
| **QUAL-16[a]:** Funding assistance should be sought from Ecology through its grants and loans programs to implement actions and ongoing monitoring. Other funding sources should be identified and applications submitted to provide funding for ongoing activities. The WQTS will recommend qualified entities to conduct associated monitoring (WQTS, 2006d). | See Implementation Activities Table in WQTS (2006d) |

a = This recommended action *only* applies to the sub-watersheds that have a 2004 303(d) listing for temperature. See Figure 7-1.

**TABLE 2-5**

## Habitat Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Habitat protection and restoration/enhancement*** | |
| **H-1:** Implementation of watershed planning will be coordinated with the Salmon Recovery Implementation Schedule (the Implementation Plan Matrix is Appendix H in UCSRB (2005)) and the Upper Columbia Salmon Recovery Implementation Team. The Wenatchee Habitat Subcommittee will serve as the local coordinating body for implementation of salmon recovery habitat actions across the watershed. Chelan County Natural Resource Department is currently developing a habitat project database that will be available to the subcommittee in the near future to list past projects, track current projects, and evaluate what future habitat actions should take place. | CCNRD |
| **H-2:** The WRIA 45 Planning Unit supports implementation of projects identified in the Wenatchee River and Nason Creek Channel Migration Zone Study (Jones and Stokes, 2004). | WWPU |
| **H-3:** The WRIA 45 Planning Unit supports implementation of the actions in the Wenatchee Subbasin Plan (Subbasin Plan sections 7.4 to 7.8 (NPCC, 2004)), and supports the Subbasin Plan approach to evaluation and monitoring of terrestrial and aquatic ecosystems in the Wenatchee Watershed. Section 2.5.1 of the Wenatchee Subbasin Plan which lists key findings from the Terrestrial Assessment is reproduced in Appendix C. The Planning Unit asks the co-planners and co-managers to seek funding from Bonneville Power Administration (BPA) and other sources for implementation of these actions. | WWPU, Co-managers, BPA |
| **H-4:** The Habitat Subcommittee with Chelan County as lead should coordinate with funding organizations and action agencies to maintain a publicly accessible database of past and current habitat projects for the Wenatchee Watershed. | Habitat Subcommittee |
| **H-5:** The Planning Unit will provide opportunities for public comment on watershed scale studies and plans when, by a vote of the Planning Unit, they are determined to be a priority of the Planning Unit and important to aquatic health and habitat. | WWPU |
| **H-6:** The mainstem Wenatchee River provides habitat *important to the entire watershed* for many life stages of spring and summer Chinook, steelhead, bull trout and other culturally important species, and needs to be protected, enhanced, and restored. All remaining intact areas on the mainstem should be maintained. Where possible, floodplain function should be restored, particularly from the Mission Creek confluence downstream to the Columbia River confluence. | Chelan County, others? |
| **H-7:** All property owners and managers in the watershed are encouraged to continue to cooperate in maintaining forest roads. Opportunities for inter-agency or multiple owner cooperation in roads management should continue to be supported (Additional and background information on forest roads in presented in Appendix C). | Forest Service, Private forest interests: Property owners and managers |
| **H-8:** Noxious weeds threaten aquatic and terrestrial ecosystems throughout the Wenatchee Watershed. The Planning Unit supports efforts toward noxious weed control and eradication. | WWPU |
| **H-9:** Consider using the Icicle Fund "Natural Resource Profile" as a tool to identify terrestrial habitat opportunities (Pacific Biodiversity Institute, 2002). | CCNRD |

**TABLE 2-5**

## Habitat Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| **H-10:** A fish barrier inventory has been conducted in many areas of the watershed; however, key inventory data regarding each barrier is not always consistent (i.e. whether it is a partial or full barrier, etc.). A method for updating the inventory should be established and funded. The Chelan County fish barrier inventory should be integrated with fish barrier information collected by other land managers, such as the Forest Service. Look at SalmonScape as a starting point for integrating barrier information. The organization has been able to integrate barrier information from other land managers. In addition, the Habitat Subcommittee should try to address the need to include irrigation diversions, specifically pump diversions, in the Chelan County Fish barrier inventory using appropriate funding sources. | CCNRD, others? |
| **H-11:** Efforts that are ongoing in the Wenatchee Watershed to improve or maintain habitat quality need to be encouraged and retained. Recognize and acknowledge achievements in the watershed that have accomplished habitat improvement or protection. Develop a landowner or organization recognition program to recognize habitat improvement projects or achievements in the watershed. | CCNRD |
| **H-12:** Initiate public information efforts to discourage harassment of spawning salmonids (UCRTT, 2002). | |
| **H-13:** Salmon habitat restoration and protection actions should be coordinated with the Wenatchee Habitat Subcommittee to ensure consistency with watershed-wide strategies as identified in the watershed plan and other plans. Additionally, all other actions related to salmon recovery, including hatchery, harvest and hydropower activities, should be coordinated with the Wenatchee Habitat Subcommittee. Hatchery, harvest and hydropower activities that have a negative or adverse affect on local habitat restoration or protection actions must be carefully considered in the context of the local habitat strategy. | CCNRD |
| ***Short-term*** | |
| **H-14:** Address passage barriers (UCSRB, 2005). | |
| **H-15:** Address diversion screens (UCSRB, 2005). | |
| **H-16:** Reduce the abundance and distribution of brook trout through feasible means (e.g., increased harvest) (UCSRB, 2005). | |
| **H-17:** Protect and maintain stream and riparian habitats within Category 1 assessment units (UCSRB, 2005). | |
| **H-18:** Protect, maintain, or enhance beneficial stream and riparian habitat conditions established by implementing Short-term Actions within assessment units (UCSRB, 2005). | |
| **H-19:** Where feasible and practical, maintain connectivity throughout the historical distribution of the species (UCSRB, 2005). | |

**TABLE 2-5**

## Habitat Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Administrative/Institutional*** | |
| **H-20:** NOAA Fisheries, U.S. Fish and Wildlife Service (USFWS), the Army Corp of Engineers, and State agencies should improve the permitting process for projects specific to recovery actions by reducing the time, cost, and review process requirements. These entities should also implement programmatic consultations for actions related to the implementation of the Spring Chinook Salmon, Steelhead, and Bull Trout Recovery Plan and improve their review of species recovery projects with the local governments (UCSRB, 2005). | |
| ***Research and Monitoring*** | |
| **H-21:** Wenatchee Habitat Subcommittee members can attend an annual Upper Columbia Monitoring Coordination Workshop for regular updates on all watershed-wide and other monitoring programs. In addition, the Subcommittee will be updated by the Regional Technical Team, as available, to ensure consistency across planning processes as well as to evaluate the effect of habitat improvement projects in the watershed. | CCNRD, Regional Technical Team |
| ***Hatchery Related*** | |
| **H-22:** The effects of hatchery practices in the Upper Columbia Basin on productivity are currently unknown. Research on reproductive success of hatchery produced fish that spawn in the wild is needed to assess effects on productivity (UCSRB, 2005). | |
| **H-23:** Additionally, future hatchery facilities will support recovery goals, and minimize and mitigate any impacts (including goals within other hatchery, harvest and hydropower activities). This list should not be considered all inclusive and specific actions will be determined and negotiated by the responsible parties (UCSRB, 2005). | |
| **H-24:** Determine whether supplementation programs in the Wenatchee Sub-basin affect the viable salmonid population (VSP) parameters of spring Chinook (UCSRB, 2005). | |
| **H-25:** Develop, maintain, and provide a comprehensive inventory of habitat projects and their costs and benefits (effectiveness) to the public annually (UCSRB, 2005). | |

**TABLE 2-6**

**Implementation Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| ***Watershed Planning Administration and Plan Updates*** | |
| **IMP-1**: WWPU and Subcommittees will continue to exist and operate under the current operating procedures and will address any needed reorganization to implement the plan as part of Phase IV, Implementation. | WWPU, CCNRD |
| **IMP-2**: Build a revision process and schedule for the Wenatchee Watershed Plan into plan implementation. Ensure that new plan actions and best available science can be integrated in the future. Planning horizon will be 20 years (through 2025). Updates should be scheduled every seven years, also consistent with County comprehensive plan revision schedule. If additional updates are necessary based on the availability of data or unforeseen water-related issues, the process should be designed such that those updates are possible.<br><br>Future amendments and additions to the Plan will be approved by the Planning Unit (implementing body) according to an Intergovernmental Agreement, bylaws, and/or operating procedures and will be subject to a public review process including opportunities for comment at meetings of the PU (or other implementing body) and special community or public meetings. *No organization can be obligated to implement an action included in the plan or a plan update, unless they agree to the obligation (RCW90.82.130(3)).* | WWPU, Chelan County |
| ***Funding and Staffing*** | |
| **IMP-3**: Prioritize educational needs, projects, policies and management strategies for funding and implementation (may accomplish some prioritization for Aquatic Habitat Actions through salmon recovery). | WWPU or other implementing body |
| **IMP-4**: Continue to identify alternate funding sources (alternate to watershed planning funds). | CCNRD, WWPU |
| **IMP-5**: Consider implementation funding for grant writers. | CCNRD, WWPU |
| **IMP-6**: Develop recommendations (such as cooperative agreements) for formalizing obligations with the entities identified as responsible for Plan actions. | CCNRD, WWPU |
| **IMP-7**: The Chelan County Natural Resource Department (CCNRD) provides a vital link between water availability, land management and the Watershed Planning Unit. The Watershed Planning Unit supports the ongoing efforts of CCNRD to work with the Watershed Planning Unit to ensure natural resource concerns and technical resources and databases are maintained. | CCNRD |
| ***Coordination within the Watershed*** | |
| **IMP-8**: In developing its implementation plan, the Watershed Planning Unit will support the development and implementation of existing plans and programs occurring within the watershed while striving to avoid inconsistent or duplicative activities and policies. | WWPU |
| **IMP-9**: The Planning Unit can choose to review and provide comment on large projects proposed in the watershed that would likely have an impact on the water resource. This could be a review of project or programmatic level Environmental Impact Statements (EISs) or other documents. | WWPU |

**TABLE 2-6**

**Implementation Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **IMP-10**: The WRIA 45 Planning Unit members will be involved in the public planning process. The Planning Unit will disseminate information about public comment opportunities to its members. Additionally, the Planning Unit will provide opportunities for public comment on watershed scale studies and plans when, by a vote of the Planning Unit, they are determined to be a priority of the Planning Unit and important to the overall health of the watershed. | WWPU |
| ***Monitoring*** | |
| **IMP-11**: Ensure that there is an ongoing coordinated monitoring program consistent with the Intensively Monitored Watershed Program currently being administered through NOAA Fisheries and the RTT. Designate responsible entities, a single data management hub for long term monitoring, and a single custodian to store and manage and generally oversee this effort into the future (requires long term commitment). | WWPU |
| ***Adaptive Management*** | |
| **WRMS-3**: The WWPU with Chelan County taking the lead role will participate in the development and implementation of an adaptive management process to support this water resource management strategy. The process should address flexibility in the distribution of the reserve across the WRIA. The details of the adaptive management process will be determined as part of Phase IV Implementation. | WWPU, Chelan County |
| **WRMS-4c**: Recommends a new stream gage be established at the existing control point on the Icicle Creek. Details will be determined during Phase IV, Implementation. | Ecology |
| **MissionQUANT-1**: Chelan County as lead (with support from Ecology), will convene a Mission Creek Forum to assess options to provide water for future growth through the purchase, lease or transfer of existing, valid water rights or from storage (storage opportunities within Mission Sub-watershed or through the Peshastin and/or Icicle Irrigation districts). This will be conducted for the purpose of providing an uninterruptible supply for domestic, municipal and stock water uses. During Phase IV, Implementation, the Mission Creek Forum will determine whether the strategies for Mission are relevant to Brender Creek, and consider assembling separate strategies to address local instream flow concerns and conditions for Brender Creek, if appropriate.<br><br>Within two years of rule adoption, the Forum will have developed opportunities and researched funding opportunities for these alternatives. | Chelan County, with participation from Ecology |
| **MissionQUANT-2**: As part of Phase IV, Implementation, evaluate alternatives that could increase available water for instream and out-of-stream uses. Clearly address specific water needs in the Mission Creek and evaluate water conservation, storage, purchase, lease and transfer of water rights, water from other sub-watersheds, and other alternatives as appropriate. | |
| **PeshastinQUANT-3**: As part of Phase IV, Implementation, evaluate alternatives that could increase available water for instream and out-of-stream uses. Clearly address specific water needs in the Peshastin and evaluate water conservation, storage, purchase, lease and transfer of water rights, and other alternatives. | |

**TABLE 2-6**

**Implementation Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **ChumQUANT-10**: As part of Phase IV, Implementation, the Planning Unit and the Chumstick Forum (with Chelan County as lead) will evaluate alternatives that could increase available water for instream and out-of-stream uses. Clearly address specific water needs in the Chumstick and evaluate water conservation, storage opportunities, purchase, lease and transfer of water rights, water transfer from other sub-watersheds, and other alternatives. Consider conjunctive use and evaluate pumping from the deep aquifer to augment flows in the Chumstick. Investigate storage options where stored water could be used to augment flows and provide mitigation water. | |
| **QUANT-6**: Develop an administrative structure for a water bank for WRIA 45. Section 5.1.3 introduces water banks; however, the details of the administration of a water bank in WRIA 45 will be determined in Phase IV, Implementation. | WWPU, Chelan County |
| **QUANT-8**: Chelan County Natural Resource Department will develop and administer a monitoring program to assess actual domestic water use to verify the 380 gpd per household assumption used to debit the reservation and to adjust the amount of water remaining in the reservation at five year intervals, or more frequently if the number of wells drilled or building permits granted indicate that growth is occurring more rapidly than projected in any sub-watershed. These assessments will be conducted based on a statistical sample of new domestic water users (single domestic, group domestic and municipal water use and associated lawn and garden irrigation (some with separate irrigation, some without), some with stock, etc.). Metering data will be incorporated into the water use audit and the accounting system. See the recommended action in the Plan for more details. | CCNRD |
| **QUANT-9**: Reservation accounting will include the tracking of new exempt wells by Chelan County through the building permit process, septic approval through the Chelan-Douglas Health District (CDHD), tracking new domestic and municipal water rights granted by Ecology and tracking well drilling permits as issued by Ecology. The mechanism for tracking the permitted uses will be determined as part of Phase IV, Implementation. Chelan County is currently developing a method for tracking new permit-exempt wells in WRIA 46. This should also be considered for WRIA 45. | CCNRD |
| **QUANT-9b**: New rights that are granted by Ecology for domestic water uses will be tracked by CCNRD. The mechanism for tracking the new permitted uses that will debit the reserve will be determined as part of Phase IV, Implementation. | CCNRD, Ecology |

**TABLE 2-6**

**Implementation Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **QUANT-10**: The Planning Unit recommends metering be required for all new uses eligible under the reserve. The Planning Unit will further define responsible entities, and staffing, budget and funding considerations of the metering program as part of Phase IV, Implementation. Chelan County, CDHD, Ecology, utilities, and others will work together to structure the program. The following should be addressed as part of phase IV:<br>• Identify responsible entities, and address staffing, cost and funding concerns<br>• Consider implementation by an existing utility with an existing metering program<br>• Consider having water users read their own meters<br>• Consider use of Ecology's water measuring system and database<br>• Consider metering options for existing water users and development of a voluntary program that uses existing metering programs' available meters. | WWPU |
| **QUANT-11**: Undertake hydrogeologic studies to assess the influence of groundwater withdrawals on surface water. Identify funding for this study and responsible parties (WWPU to identify sub-areas for study, responsible entity as part of Phase IV, Implementation). | CCNRD |
| **QUANT-14**: Credit a water service provider for abandoned and/or decommissioned exempt wells. This action will be further developed in Phase IV, Implementation. The well consolidation process is addressed in RCW 90.44.105. This statute presumes a credit of 800 gpd/well unless an alternative minimum is established by Ecology in consultation with DOH or there is credible evidence of non-use. | Ecology, Chelan County, Water Systems |
| **QUANT-15**: As part of Phase IV, Implementation, Chelan County and cities should develop policies that can be used to ensure efficient use of water in the event of a land division or new development. See QUANT-15a to QUANT-15f for a list of the policies. | Chelan County, cities |
| **QUANT-15a**: For land division applications that have shares in an irrigation district, develop policies requiring that the developer provide tie-ins to the irrigation box; ensure easements; deliver water to parcels, where practicable; and form a Homeowners Association for residential uses. Encourage Irrigation Districts to work with the county and cities to extend infrastructure and irrigation water service where practicable. | Chelan County, cities |
| **QUANT-15f**: Encourage cluster development, and group domestic over single domestic systems to increase water use efficiency. Explore encouraging group domestic over single domestic use as part of the approval process for land division applications. Further develop this recommendation as part of Phase IV, Implementation. | Chelan County, cities |
| **QUANT-16d**: As part of Phase IV, Implementation, convene a forum to investigate conservation strategies and how they could be implemented by irrigation districts, ditches and other private companies. Involve utilities, cities, Chelan County and Ecology when appropriate. There is a need to work with members of irrigation districts, ditches and others to determine ways to save water and ensure that water rights are protected into the future. Items of discussion could include alternative rate structures based on purpose of water use; partnerships with cities and utilities; utility coordination during development; tools to conserve water, improve instream flows and protect water rights at the same time; and distribution of public education materials. | Chelan County, Irrigation Districts, Canal Companies, other Agriculture, cities, PUD. Ecology, others |

**TABLE 2-6**

**Implementation Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **QUANT-18:** Encourage the County to provide information and education about water conservation options and fire planning; including: outdoor watering, timing, types of native vegetation that require low water use, lawn size, low flow fixtures, etc. to the new land user. The Municipal Water Law requires that water systems provide education and outreach regarding water conservation. However, water users that are using irrigation ditch water for outdoor use and/or exempt wells will not receive this information. Irrigation systems may also be able to provide materials in monthly billings. The details of this educational program will be determined during Phase IV, Implementation. Realtors should be encouraged to distribute public education materials describing water conservation and efficient water management techniques. | Chelan County |
| **QUANT-20b**: Study groundwater in specific areas of the watershed (eg., Mission Creek, Lower Chumstick/Eagle Creek area, Monitor area). Finalize the areas for study as part of Phase IV, Implementation. | |
| **QUANT-21**: Evaluate the consumptive portion of reserved water uses and determine if recharge credit should be included in the accounting of the reservation. | |
| **IMP-12**: Revise and refine water quality management strategies for both point and nonpoint source pollutants to reflect new data. | |
| **IMP-13**: Perform additional studies to fill data gaps and address unanswered questions as determined by the Water Quality Technical Subcommittee. Ecology will partner with stakeholders in the watershed to conduct studies addressing information gaps (eg., monitoring). | WQTS, Ecology |
| **QUAL-4**: Encourage the Wenatchee Watershed Planning Unit and its other subcommittees (Water Quantity, Instream Flow, Habitat, and Growth and Land Use) to use the information in the TMDL Technical Reports and SISs along with their conclusions, recommendations, and actions for a more holistic approach to restoration, preservation, and enhancement of the watershed for all beneficial uses (WQTS, 2006a; WQTS, 2006b; WQTS, 2006c; WQTS, 2006d). | WWPU, WQTS, Water Quantity Subcommittee, Instream Flow Subcommittee, Habitat Subcommittee, and Growth and Land Use Subcommittee |
| **QUAL-5**: Appropriate actions to be used in the appropriate location should be determined to address temperature exceedances in Phase IV, Implementation for all of the temperature-related recommendations in the Plan. | |
| **LowWenQUAL-2**, **IcicleQUAL-2** and **UpWenQUAL-2:** Strategies to address point and non-point sources of phosphorus as part of the TMDL for DO and pH will be reported during the implementation phase of the Wenatchee Watershed planning effort. | |
| **IMP-14**: Further analysis and discussion may need to take place in Phase IV, Implementation regarding maximum allocation limits in specific sub-watersheds and the mainstem Wenatchee and the relationship between the allocations, and habitat and channel-forming processes. | |
| **IMP-15**: All actions specified in the Wenatchee Watershed Plan should be revisited by the Planning Unit during Phase IV, Implementation. | |

**TABLE 2-7**

## Public Outreach Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Water Quantity*** | |
| **ChumQUANT-11**: Encourage conservation and outreach. | CDHD, CCNRD, Chelan County |
| **NSTQUANT-3**: Chelan County and Ecology to provide public information regarding water limitations in Northside Tributaries (Fact Sheets). | Chelan County, Ecology |
| **QUANT-13**: Provide public education as to the roles, responsibilities and regulations pertinent to exempt wells, and encourage the proper entities to enforce/implement (CDHD, DOH, Ecology, County). | CDHD, DOH, Ecology, County |
| **QUANT-15e**: Provide public information that encourages actions QUANT-15a through QUANT-15d, and explains the benefits (provide this information during subdivision application or preliminary plat comment period). | Chelan County, cities, other water purveyors, also CDHD |
| **QUANT-16d**: As part of Phase IV, Implementation, convene a forum to investigate conservation strategies and how they could be implemented by irrigation districts, ditches and other private companies. Involve utilities, cities, Chelan County and Ecology when appropriate. There is a need to work with members of irrigation districts, ditches and others to determine ways to save water and ensure that water rights are protected into the future. Items of discussion could include alternative rate structures based on purpose of water use; partnerships with cities and utilities; utility coordination during development; tools to conserve water, improve instream flows and protect water rights at the same time; and distribution of public education materials. | Chelan County, Irrigation Districts, Canal Companies, other Agriculture, cities, PUD. Ecology, others |
| **QUANT-18:** Encourage the County to provide information and education about water conservation options and fire planning; including: outdoor watering, timing, types of native vegetation that require low water use, lawn size, low flow fixtures, etc. to the new land user. The Municipal Water Law requires that water systems provide education and outreach regarding water conservation. However, water users that are using irrigation ditch water for outdoor use and/or exempt wells will not receive this information. Irrigation systems may also be able to provide materials in monthly billings. The details of this educational program will be determined during Phase IV, Implementation. Realtors should be encouraged to distribute public education materials describing water conservation and efficient water management techniques. | Chelan County |
| ***Habitat*** | |
| **H-11:** Efforts that are ongoing in the Wenatchee Watershed to improve or maintain habitat quality need to be encouraged and retained. Recognize and acknowledge achievements in the watershed that have accomplished habitat improvement or protection. Develop a landowner or organization recognition program to recognize habitat improvement projects or achievements in the watershed. | CCNRD |
| **PO-1**: Provide support of specific education and outreach programs in the watershed. Programs include: 4H Forestry Education Program, Kids in the Creek, Salmon Fest, Trout Unlimited education programs, Bird Fest, Chelan Douglas Land Trust field trips, Hatchery programs (Leavenworth National Fish Hatchery, and friends of NW Hatcheries), existing noxious weed/native plant education programs, and others. | |

**TABLE 2-7**

**Public Outreach Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **PO-2**: Encourage the 4-H program and CCCD to develop and conduct watershed clean-up education programs. | |
| **H-12**: Initiate public information efforts to discourage harassment of spawning salmonids (UCRTT, 2002). | |
| ***Water Quality*** | |
| **LowWenQUAL-9**, **IcicleQUAL-7** and **UpWenQUAL-8**: Nutrients (phosphorous) can enter surface and ground water from residential yards and gardens, hobby farms, City and County Parks, business owned landscapes, etc. An education outreach plan should be developed and implemented to heighten awareness and reduce inputs from these sources. Policies and practices should be implemented in City and County Public Works departments. The County and cities should consider implementing a ban on the sale of high phosphate detergents, such as is being considered in Spokane. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **MissionQUAL-6**: Activities should be identified and undertaken to provide ongoing outreach, education, and technical assistance to growers, streamside landowners, developers, stakeholders, and the general public (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| **MissionQUAL-14** and **ChumQUAL-3**: CDHD will continue to implement onsite sewage disposal system technical assistance and education programs for homeowners and the industry (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-15** and **ChumQUAL-4**: The CDHD will continue to permit sewage systems per Washington Administrative Code (WAC), including analyzing soils and technologies suitable for individual sites; review/approve the proposed design, specifications, installation and if required, the ongoing maintenance in accordance with the WAC; provide public information under real estate disclosure laws; and review all land use proposals to ensure that the WAC is properly enforced prior to approval by the County (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-20** and **ChumQUAL-9**: Conduct stream walk cleanups along the stream (Fall, Spring, Summer) with area schools, homeowners, and other groups (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-21** and **ChumQUAL-10**: Conduct ongoing community fecal coliform education/awareness campaigns throughout the year. Engage and get support from homeowners (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-23** and **ChumQUAL-12**: Conduct education and enforcement actions to stop illegal dumping of wastes either to storm drains or directly to surface waters. This dumping may be of portable toilet wastes, recreational vehicle wastes, etc. (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-25** and **ChumQUAL-14**: The WQTS and its participating entities should work with the public and homeowners regarding BMPs to reduce fecal coliform runoff. General actions should include public information, education, and technical assistance regarding watering practices, landscaping, stormwater runoff, filtration practices, animal waste, etc. (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |

**TABLE 2-7**

## Public Outreach Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Sub-watersheds*** | |
| **PO-3**: CCNRD to ensure that summary fact sheets are created by sub-watershed and develop and provide outreach materials for people at different levels: technical, non-technical, etc. | |
| **PO-4**: Prepare Community Documents by tributary (or sub-watershed) that describe the watershed and the water related management strategies that have been recommended to address specific issues in the individual sub-watersheds. An example was prepared for the Icicle Sub-watershed. Obtain funding to create, produce and distribute these documents. | |

**TABLE 2-8**

## Lower Wenatchee River Sub-watershed Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Water Availability in the Northside Tributaries area*** | |
| **NSTQUANT-1:** Future water supply availability should be discussed with Chelan County Public Utility District (PUD) to determine whether they have the capacity and infrastructure to provide backup supply. The East Bank Aquifer Regional Water Supply will only be considered as a source of water for this area if approved by the owners of the Regional Water Supply. | Chelan County PUD, others? |
| **NSTQUANT-2:** PUD and Chelan County to consider pumping from Wenatchee Valley and a potential PUD hookup in Nahahum. | PUD, Chelan County |
| **NSTQUANT-3:** Chelan County and Ecology to provide public information regarding water limitations in Northside Tributaries (Fact Sheets). | Chelan County, Ecology |
| **NSTQUANT-4:** Chelan County and Ecology to work with local community to design and implement a groundwater monitoring program in existing wells to determine trends in groundwater levels. | Chelan County, Ecology |
| **NSTQUANT-5:** Alternatives Analysis for Northside Tributaries to include options such as use of out-of-basin water, pumping from lower Wenatchee reserve, PUD hookup, deep groundwater, storage, and water right purchase. | |
| ***pH/ DO*** | |
| **LowWenQUAL-1:** The partnership formed to secure funding for further study of DO and pH (Chelan County, Chelan County PUD and the cities of Cashmere, Leavenworth and Wenatchee) should continue to work together, with the WQTS to acquire funding assistance and work with the WQTS to:<br>• Facilitate and develop a workable strategy that can be used and ultimately approved by the EPA and in Ecology's TMDL submittal for DO and pH, and<br>• Review and make suggestions for future improvements to Ecology's technical assessment, summary implementation plan, and adaptive management approaches to meet state water quality standards for these parameters. | Chelan County, Chelan County PUD, Cashmere, Leavenworth, Wenatchee, WQTS |
| **LowWenQUAL-2:** Strategies to address point and non-point sources of phosphorus as part of the TMDL for DO and pH will be reported during the implementation phase of the Wenatchee Watershed planning effort. | |
| **LowWenQUAL-3:** Large reductions of phosphorus inputs are needed from point sources in the Wenatchee River Watershed, especially waste water treatment plants (WWTPs). A regulatory strategy should be developed and implemented with WWTPs and Ecology to institute controls over time through National Pollutant Discharge Elimination System (NPDES) permits that will reduce phosphorous discharges to surface and groundwaters. WWTPs to be addressed include the Lake Wenatchee, Stevens Pass, Leavenworth, Peshastin, and Cashmere waste water treatment plants. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-4:** Controls should be developed and implemented through new and existing regulatory permits, if needed, to reduce phosphorous inputs to surface and groundwaters from other Wenatchee Watershed point sources. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |

**TABLE 2-8**

**Lower Wenatchee River Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **LowWenQUAL-5:** Large reductions of phosphorus inputs are needed from nonpoint sources in the Wenatchee River Watershed. Mass-balance modeling showed that two reaches of the lower Wenatchee River exhibit higher diffuse phosphorous loading than other reaches. One reach brackets the community of Dryden and the other brackets the city of Cashmere. Studies should be done in these two reaches, focusing on groundwater-surface water interaction and land-uses that may be contributing phosphorus inputs to the river. Actions should be implemented based on the conclusions and recommendations of these studies to reduce inputs of phosphorous from these areas (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-6:** Groundwater discharges to the Wenatchee River, Icicle Creek, and their tributaries affects dissolved oxygen levels and nutrient concentrations. Groundwater is discharged to the river or creeks in some reaches, and is recharged in other reaches. In the Wenatchee basin, groundwater flow and Biochemical Oxygen Demand (BOD)/nutrient concentrations may be elevated due to upland practices such as orchard irrigation and wastewater discharge to groundwater from lagoons and on-site septic systems. Assessments of groundwater contributions and sources of nutrients (phosphorous) should be conducted. Actions should be implemented based on the conclusions and recommendations of these studies to reduce inputs of phosphorous from these areas (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-7:** Non-point sources along the length of the river may be contributing BOD and nutrients. Address failing septic systems through actions identified in the Wenatchee Watershed Fecal Coliform TMDL. Continue site specific inspections and enforcement of regulations that restrict placement of on-site septic drain fields from areas deemed to have unsuitable soils. A study should be conducted to assess soils and onsite septic systems. Estimates should be made of the maximum number and density of on-site drain fields that the upper basin can accommodate and still meet the water quality standards, as was done in the Lake Chelan study (Patmont et al., 1989). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-8:** Nutrients (phosphorous) can enter streams from storm water events. Work with Chelan County and municipalities to reduce storm water inputs, utilizing the Eastern Washington Storm water Manual or equivalent. Encourage the appropriate entities to include language that addresses storm water in comprehensive plans and ordinances. Work with developers. (See LowWenQUAL-18). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-9:** Nutrients (phosphorous) can enter surface and ground water from residential yards and gardens, hobby farms, City and County Parks, business owned landscapes, etc. An education outreach plan should be developed and implemented to heighten awareness and reduce inputs from these sources. Policies and practices should be implemented in City and County Public Works departments. The County and cities should consider implementing a ban on the sale of high phosphate detergents, such as is being considered in Spokane. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |

**TABLE 2-8**

**Lower Wenatchee River Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **LowWenQUAL-10:** Nutrients can enter streams from materials used to de-ice, clean, and maintain roads and parking lots. Animal waste from roads and parking lots can enter streams and increase nutrient loading. Work with the County, cities, businesses, and the WA State Department of Transportation to determine if road and parking lot maintenance practices may be contributing to nutrient loading and if necessary investigate ways to reduce nutrient inputs from these practices. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-11:** Nutrients (phosphorous) can be released to ground and surface waters from development practices, such as disruption of soils during conversions of orchard lands to housing. Actions should be conducted to prevent nutrients from entering ground and surface waters before, during and after construction. Work with developers to implement these actions. Encourage entities to include appropriate language in county and city comprehensive plans, growth management, and critical area ordinances. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-12:** The operation of Columbia River dams apparently backs up the Wenatchee River from its mouth approximately one mile. It has been hypothesized that this back-water may contribute to the exceedances of pH and dissolved oxygen levels in that reach. Work with the Chelan PUD to conduct an assessment of the possible back-water effect that may be created by operation of the Rock Island dam. Implement actions from the report's conclusions and recommendations to improve water quality (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-13:** Consider implementing actions recommended in the Wenatchee River Basin Temperature and Fecal Coliform TMDLs if the actions address problems that have been identified in the Lower Wenatchee. Lowering temperatures and reducing nutrient inputs will improve pH and dissolved oxygen levels in the Wenatchee River Watershed (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-14:** Reserve load capacities for Biochemical Oxygen Demand (BOD) and nutrients should be established for the Upper Wenatchee River and Icicle Creek. Reserve load capacities are needed because there is no additional assimilative capacity for dissolved oxygen in the upper watershed during critical conditions. A point source regulatory strategy and nonpoint source BMP strategy should be developed to protect the reserve capacities and maintain water quality standards (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-15:** Encourage lining of earthen canals where appropriate. Work with irrigation districts to implement BMPs and adaptive management programs to minimize any nutrient loading that is not already being addressed (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-16:** Agricultural practices can contribute nutrients to ground and surface waters through crop watering practices, application of fertilizers, and soil disturbance activities. Work with the agricultural community to encourage practices that will reduce nutrient inputs to ground and surface waters while enhancing crop quality and yield. Examples include technical assistance through farm plans and Best Management Practices (BMPs). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |

**TABLE 2-8**

**Lower Wenatchee River Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **LowWenQUAL-17:** Funding for these projects should be sought through Department of Ecology Centennial and 319 grants and loans. Identify and access other funding sources through the Planning Unit and other entities. Ongoing adaptive management should be utilized to provide the best use of funds and environmental benefits (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-18:** Proper filtration of nutrients through land use practices can have a beneficial effect on nutrient reductions to ground and surface waters. Encourage implementation of wetlands, filter strips, riparian vegetation, bio-swales, drainage basins, pervious surfaces, etc. in residential, commercial, agricultural, industrial, development, and municipal practices. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **LowWenQUAL-19:** Identify and investigate any non point sources in tributaries that may be contributing to nutrient loads (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| ***Habitat Restoration/Enhancement*** | |
| **LowWenH-1:** Use practical and feasible means to increase stream flows (within the natural hydrologic regime and existing water rights) in the Wenatchee River (UCSRB, 2005). | |
| **LowWenH-2**: Reduce water temperatures by restoring riparian vegetation along the river (UCSRB, 2005). | |
| **LowWenH-3:** Increase habitat diversity and quantity by restoring riparian habitat along the Wenatchee River, reconnecting side channels and the floodplain with the river, and increasing large woody debris in the side channels (UCSRB, 2005). | |
| **LowWenH-4:** Protect existing riparian habitat and channel migration floodplain function (UCRTT, 2002). | |

**TABLE 2-9**

## Mission Creek Sub-watershed Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Water Availability*** | |
| **MissionQUANT-1:** Chelan County as lead (with support from Ecology), will convene a Mission Creek Forum to assess options to provide water for future growth through the purchase, lease or transfer of existing, valid water rights or from storage (storage opportunities within Mission Sub-watershed or through the Peshastin and/or Icicle Irrigation districts). This will be conducted for the purpose of providing an uninterruptible supply for domestic, municipal and stock water uses. During Phase IV, Implementation, the Mission Creek Forum will determine whether the strategies for Mission are relevant to Brender Creek, and consider assembling separate strategies to address local instream flow concerns and conditions for Brender Creek, if appropriate. Within two years of rule adoption, the Forum will have developed opportunities and researched funding opportunities for these alternatives. | Chelan County, with participation from Ecology |
| **MissionQUANT-2:** As part of Phase IV, Implementation, evaluate alternatives that could increase available water for instream and out-of-stream uses. Clearly address specific water needs in the Mission Creek and evaluate water conservation, storage, purchase, lease and transfer of water rights, water from other sub-watersheds, and other alternatives as appropriate. | |
| **MissionQUANT-3:** One quarter (0.03 cfs) of the 0.12 cfs projected 2025 water needs is available for growth for two years after rule adoption. If, after two years, water rights are not purchased or leased to cover the interim reserve of 0.03 cfs or conservation measures that provide additional water are not implemented, Ecology would close the Mission Sub-watershed to further appropriation on a seasonal basis, and existing outdoor water use established subsequent to the adoption of WAC 173-545 could be curtailed when flows are not met. All water allocated to the City of Cashmere will be debited to the Lower Wenatchee Reserve and not to the Mission Reserve. | |
| **MissionQUANT-4:** Consider storing water in Icicle/Peshastin and use that water to augment flows and provide mitigation water in Mission Creek. | |
| **MissionQUANT-5:** Consider storage opportunities within Mission Sub-watershed (See Section 5.5). | |
| **MissionQUANT-6:** Metering of all new uses covered under the Mission reserve (includes all new domestic uses). | |
| **MissionQUANT-7:** Evaluate out-of-kind mitigation and enhancement projects over time, if appropriate. Identify habitat and water quality improvements to mitigate additional reserve water. | |
| **MissionQUANT-8:** Chelan County or other entity with agency funding assistance will investigate water rights for purchase or lease as part of the mitigation and enhancement strategy for Mission Sub-watershed. The County will seek funding from BPA, Ecology, Washington Rivers Conservancy, Washington Water Trust, and others. As water rights are purchased or transferred for use in the Mission reserve to meet a "no net impact" standard, the first purchase(s) will credit the 0.03 cfs interim reserve, then the additional 0.09 cfs will be available for forecasted growth as it is purchased. | Chelan County or other entity |

**TABLE 2-9**

**Mission Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| ***DDT*** | |
| **MissionQUAL-1:** Significant reductions in DDT loads may be achieved by preventing bank erosion or by other means of limiting transport of upland soils to streams. BMPs such as riparian buffers and wetlands can also filter and uptake DDT from surface and groundwater. Many BMPs are currently being implemented in the watershed. BMPs should be continued, refined, expanded, and monitored to further reduce erosion, surface runoff, TSS in the water column, and groundwater transport of DDT. BMPs include farm practices, storm water runoff, riparian vegetation planting, orchard conversions, residential practices, riparian buffers, wetlands, etc. These and other appropriate BMP actions and locations should be identified and implemented in coordination with the Planning Unit and its committees (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| **MissionQUAL-2:** A phased monitoring approach should be conducted to assess the effectiveness of BMPs and DDT-TSS (Total Suspended Solids) reduction efforts. This may take time to achieve and, as TSS loads are reduced and DDT levels are monitored, TSS targets may be adjusted to correspond to DDT targets (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| **MissionQUAL-3:** Evaluation of soil transport to streams should be conducted during large rainfall events when visual observations can be made and/or sections of streams with high sediment runoff and TSS can be isolated. An assessment should be conducted to investigate if any other events contribute soil to streams such as spring thaw processes or irrigation practices (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| **MissionQUAL-4:** More comprehensive groundwater monitoring should be conducted, including further assessment of the relationship between surface water, groundwater, and DDT fate and transport (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| **MissionQUAL-5:** Assessments are recommended for all irrigation systems in the watershed to identify any mechanisms that may contribute to sediment transport which are not yet being addressed by BMPs. Actions should be identified and implemented to address the findings. Lining of earthen canals should be encouraged (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| **MissionQUAL-6:** Activities should be identified and undertaken to provide ongoing outreach, education, and technical assistance to growers, streamside landowners, developers, stakeholders, and the general public (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| **MissionQUAL-7:** Funding assistance should be sought from Ecology through its grants and loans programs to implement actions and ongoing monitoring. Other funding sources should be identified and applications submitted to provide funding for ongoing activities. The WQTS will recommend qualified entities to conduct associated monitoring (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |

**TABLE 2-9**

**Mission Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **MissionQUAL-8:** Development over old orchards is a primary concern. Measures should be implemented to prevent DDT laden orchard soils disturbed during construction from being transmitted to streams and lakes in the watershed. Language requiring measures to prevent DDT laden soils from entering the waterways during and after construction should be developed by the WQTS and included in County and municipality development ordinances, growth management plans, and critical area ordinances. The Stormwater Management Manual for Eastern Washington or an equivalent document should be utilized in developing ordinances, and guiding municipal, private, and construction storm water practices (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| **MissionQUAL-9:** Assessments are recommended for stormwater control systems in the watershed to identify any mechanisms that may contribute to sediment transport which are not yet being addressed by BMPs. Actions should be identified and implemented to address the findings through a list of prioritized projects (WQTS, 2006b). | See Implementation Activities Table in WQTS (2006b) |
| ***Fecal Coliform*** | |
| **MissionQUAL-10:** Identify sources of fecal coliform (FC) pollution to Mission Creek Sub-watershed, utilizing the FC technical study. Identify human and nonhuman sources and/or failing on-site septic systems. Plan and implement corrective actions. The Chelan-Douglas Health District (CDHD) should address failing septic systems. Other entities should address manageable sources of FC pollution as appropriate. See the complete action in the plan for the areas in which assessment should be conducted (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-11:** Implement and monitor BMPs to meet the Fecal Coliform TMDL Technical Assessment target reductions (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-12:** Utilizing this report, City of Cashmere, and Ecology information, work with the city of Cashmere to identify sewer system root intrusion in areas near streams. Repair and upgrade sewer collection and delivery system (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-13:** The CDHD will continue to work with consenting homeowners to conduct monitoring of on-site wells in areas of fecal coliform exceedances to help identify the source/s. Utilize this assessment (July 2003) to help identify locations for testing (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-14:** CDHD will continue to implement onsite sewage disposal system technical assistance and education programs for homeowners and the industry (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-15:** The CDHD will continue to permit sewage systems per Washington Administrative Code (WAC), including analyzing soils and technologies suitable for individual sites; review/approve the proposed design, specifications, installation and if required, the ongoing maintenance in accordance with the WAC; provide public information under real estate disclosure laws; and review all land use proposals to ensure that the WAC is properly enforced prior to approval by the County (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |

**TABLE 2-9**

**Mission Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **MissionQUAL-16:** A grant/loan funding program should be developed and implemented to replace or repair failing septic systems (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-17:** The CDHD should explore obtaining legal authority from Chelan County to operate a pumper notification program with area septage pumpers as part of its onsite septic system operation and maintenance program. The septage pumpers would work with the CDHD to appropriately identify and correct failing septic systems (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-18:** The CDHD and watershed would benefit from the funding, development and maintenance of a digital system for all onsite septic system permits issued in Chelan County, and a Geographic Information Systems (GIS) database of the onsite septic systems (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-19:** When the TMDL DIP is developed, the committee should utilize detailed recommendations from the Wenatchee River Watershed Action Plan (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-20:** Conduct stream walk cleanups along the stream (Fall, Spring, Summer) with area schools, homeowners, and other groups (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-21:** Conduct ongoing community fecal coliform education/awareness campaigns throughout the year. Engage and get support from homeowners (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-22:** Work with City, County, State, and Federal governments, and the Humane Society to deal with the feral cats and dogs living within the stream corridor. Monitor and remove dead animals within the stream corridor throughout the year (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-23:** Conduct education and enforcement actions to stop illegal dumping of wastes either to storm drains or directly to surface waters. This dumping may be of portable toilet wastes, recreational vehicle wastes, etc. (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-24:** The WQTS should encourage the CDHD, Chelan County, Cities, DOH, and Utilities to continue ongoing review and upgrading of ordinances regarding developments and sewage systems technologies (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-25:** The WQTS and its participating entities should work with the public and homeowners regarding BMPs to reduce fecal coliform runoff. General actions should include public information, education, and technical assistance regarding watering practices, landscaping, stormwater runoff, filtration practices, animal waste, etc. (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-26:** Work with irrigation districts to implement and enforce policies to prevent illegal fecal coliform discharges to irrigation canals (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-27:** Work with landowners regarding fecal coliform runoff (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |

**TABLE 2-9**

**Mission Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **MissionQUAL-28:** Encourage Chelan County and municipalities to develop and implement stormwater policies, standards, and guidelines, utilizing the Eastern Washington Stormwater Manual or equivalent, in comprehensive plans, critical area ordinances, growth management plans, and other appropriate plans (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-29:** Work with appropriate entities to reduce fecal coliform runoff from impervious surfaces (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-30:** Work with U.S. Forest Service, Washington State Department of Natural Resources, and private owners on forested lands to restore and protect streams from fecal coliform runoff pollution (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-31:** Work with wastewater purveyors to examine sewer collection systems to identify problems or damage within them that may contribute fecal coliform loading in the watershed. Correct identified problems as appropriate (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-32:** Funding assistance should be sought from Ecology through its grants and loans programs to implement actions and ongoing monitoring. Other funding sources should be identified and applications submitted to provide funding for ongoing activities. The WQTS will recommend qualified entities to conduct associated monitoring. Self-sustaining funding mechanisms to reduce fecal coliform inputs should be explored and developed in concert with the Wenatchee Watershed Planning Unit and its participating entities (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **MissionQUAL-33:** Work with the wastewater utilities regarding their ordinances to connect unconnected homes in the service area (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| ***Habitat Restoration/Enhancement*** | |
| **MissionH-1:** Re-establish connectivity throughout the assessment unit by removing, replacing, or fixing artificial barriers (culverts and diversions) (UCSRB, 2005). | |
| **MissionH-2:** Use practical and feasible means to increase stream flows (within the natural hydrologic regime and existing water rights) in Mission Creek (UCSRB, 2005). | |
| **MissionH-3:** Decrease water temperatures and improve water quality by restoring riparian vegetation along the stream (UCSRB, 2005). | |
| **MissionH-4:** Reduce unnatural sediment recruitment to the stream by restoring riparian habitat and improving road maintenance (UCSRB, 2005). | |
| **MissionH-5:** Increase habitat diversity and quantity by restoring riparian habitat, reconnecting side channels and the floodplain with the channel, increasing large woody debris within the channel, and by adding instream structures (UCSRB, 2005). | |

**TABLE 2-10**

## Peshastin Creek Sub-watershed Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Water Availability*** | |
| **PeshastinQUANT-1:** Evaluate passage requirements for fish immediately below the Peshastin Irrigation District diversion (addressing bypass reach/piping). | |
| **PeshastinQUANT-2:** Consider other instream projects that improve habitat. | |
| **PeshastinQUANT-3:** As part of Phase IV, Implementation, evaluate alternatives that could increase available water for instream and out-of-stream uses. Clearly address specific water needs in the Peshastin and evaluate water conservation, storage, purchase, lease and transfer of water rights, and other alternatives. | |
| **PeshastinQUANT-4:** Evaluate and institute programs to increase instream flows through water acquisitions, leases, and transfers. | |
| ***Habitat Restoration/Enhancement*** | |
| **PeshastinH-1:** Re-establish connectivity throughout the assessment unit by removing, replacing, or fixing artificial barriers (UCSRB, 2005). | |
| **PeshastinH-2:** Use practical and feasible means to increase stream flows (within the natural hydrologic regime and existing water rights) in Peshastin Creek (UCSRB, 2005). | |
| **PeshastinH-3:** Reduce water temperatures by increasing stream flows and restoring riparian vegetation along the stream (UCSRB, 2005). | |
| **PeshastinH-4:** Increase habitat diversity and quantity by restoring riparian vegetation, adding instream structures and large woody debris, and reconnecting side channels and the floodplain with the stream (UCSRB, 2005). | |

**TABLE 2-11**

## Chumstick Creek Sub-watershed Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Water Availability*** | |
| **ChumQUANT-1:** Chelan County as lead (with support from Ecology), will convene a Chumstick Water Forum to guide data collection, oversee the proposed water management strategy, and help develop mitigation measures. | Chelan County with support from Ecology |
| **ChumQUANT-2:** Chumstick Water Forum to assist in developing a data collection plan to monitor surface water flows (specify location) and develop management flows. | Chumstick Water Forum |
| **ChumQUANT-3:** Chumstick Water Forum, with assistance from Chelan County and Ecology, to conduct groundwater monitoring to understand hydraulic continuity and overall impact of exempt wells on groundwater levels and streamflows. | Chumstick Water Forum with assistance from Chelan County and Ecology |
| **ChumQUANT-4:** Recommend that Ecology close the Chumstick Sub-watershed for an interim period of three years while data are collected and alternatives are assessed. Uses that are not subject to the closure (and can continue throughout the three year interim closure) include: fire suppression, domestic use from wells, stock water uses, and seasonal storage, pending evaluation by the Chumstick Water Forum and Ecology. These exempt uses would be limited to a total of 0.043 cfs while studies are being performed to determine future water availability in the Chumstick and a future strategy is assessed. Seasonal storage opportunities and other alternatives in Chumstick will be evaluated by Ecology and the Chumstick Water Forum through the water right application process on a case-by-case basis during the three year interim period. Storage opportunities in Chumstick will be addressed as part of the Chumstick strategy after conclusion of the Forum's three year process and coordinated with the WRIA 45 Multi-Purpose Storage Assessment. This interim closure will be re-evaluated at the end of the three year period by the Chumstick Forum and Ecology. Note that water storage tanks as included in the Chumstick Community Wildfire Protection Program are exempt from this closure. | |
| **ChumQUANT-5:** Ecology and Chelan County to implement reservation conditions as follows: One third (0.043 cfs) of the 0.13 cfs projected 2025 water needs is available for growth for three years after rule adoption. Allocation of the remainder of the reserve would be considered only after completion of additional instream flow assessments (ChumQUANT-2) and a cumulative impacts study (ChumQUANT-3, 6) and would be subject to appropriate conditions and limitations based on the result of those assessments (ChumQUANT-7). If, after completion of the cumulative impact study, Ecology determines that the cumulative effects of domestic water uses negatively affect water available for instream flows, Ecology will consider allowing only in-house water use from the reservation. If after 3 years, water rights are not purchased or leased to cover the interim reserve of 0.043 cfs or conservation measures that provide additional water are not implemented, Ecology would close the Chumstick Sub-watershed to further appropriation on a seasonal basis, and existing outdoor water use established subsequent to the adoption of WAC 173-545 could be curtailed when flows are not met. Note that the City of Leavenworth will debit any new water from the Lower Wenatchee Reserve and not the Chumstick Reserve. | Ecology, Chelan County |

**TABLE 2-11**

## Chumstick Creek Sub-watershed Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| **ChumQUANT-6:** A cumulative impact analysis of permit exempt use and uses associated with permits and claims approved since 1983 will be initiated by Ecology as authorized under the 1983 flow rule. Chelan County will partner with Ecology in this study. The cumulative impacts assessment will help to determine whether Ecology will curtail outdoor domestic water use of wells installed after 1983, and whether Ecology will close the Chumstick Sub-watershed to outdoor water use in the future. | |
| **ChumQUANT-7:** Chumstick Forum, Chelan County and Ecology to re-evaluate a proposed strategy for the Chumstick in three years after rule adoption, when new monitoring data have been collected and assessed and cumulative impact analysis is complete. Consider allowing group domestic groundwater use of deeper aquifer only as part of the Chumstick strategy addressed by the Forum. | |
| **ChumQUANT-8:** Chelan County will evaluate alternatives to improve fish passage at the North Road culvert, and further pursue replacement of culverts upstream of North Road on Chumstick Creek. | Chelan County |
| **ChumQUANT-9:** Metering of all new uses covered under the Chumstick reserve (includes all new domestic uses). | |
| **ChumQUANT-10:** As part of Phase IV, Implementation, the Planning Unit and the Chumstick Forum (with Chelan County as lead) will evaluate alternatives that could increase available water for instream and out-of-stream uses. Clearly address specific water needs in the Chumstick and evaluate water conservation, storage opportunities, purchase, lease and transfer of water rights, water transfer from other sub-watersheds, and other alternatives. Consider conjunctive use and evaluate pumping from the deep aquifer to augment flows in the Chumstick. Investigate storage options where stored water could be used to augment flows and provide mitigation water. | WWPU, Chumstick Water Forum, Chelan County |
| **ChumQUANT-11:** Encourage conservation and outreach. | |
| **ChumQUANT-12:** Chelan County or other entity with agency funding assistance will investigate water rights for purchase or lease as part of the mitigation and enhancement strategy for Chumstick Sub-watershed. The County will seek funding from BPA, Ecology, Washington Rivers Conservancy, Washington Water Trust, and others. As water rights are purchased or transferred for use in the Chumstick reserve to meet a "no net impact" standard, the first purchase(s) will credit the 0.043 cfs interim reserve, then the additional 0.09 cfs will be available for forecasted growth as it is purchased. Consider information from adjudication records (1982-1984) when investigating water rights for purchase or lease. | Chelan County or other entity |
| ***Fecal Coliform*** | |
| **ChumQUAL-1:** Identify sources of fecal coliform pollution to Chumstick Creek Sub-watershed, including Van Creek and Upper Eagle Creek, utilizing the FC technical study. Identify human and nonhuman sources and/or failing on-site septic systems. Plan and implement corrective actions. The CDHD should address failing septic systems. Other entities should address manageable sources of FC pollution as appropriate (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |

**TABLE 2-11**

**Chumstick Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **ChumQUAL-2:** Implement and monitor BMPs to meet the Fecal Coliform TMDL Technical Assessment target reductions (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-3:** CDHD will continue to implement onsite sewage disposal system technical assistance and education programs for homeowners and the industry (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-4:** The CDHD will continue to permit sewage systems per Washington Administrative Code (WAC), including analyzing soils and technologies suitable for individual sites; review/approve the proposed design, specifications, installation and if required, the ongoing maintenance in accordance with the WAC; provide public information under real estate disclosure laws; and review all land use proposals to ensure that the WAC is properly enforced prior to approval by the County (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-5:** A grant/loan funding program should be developed and implemented to replace or repair failing septic systems (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-6:** The CDHD should explore obtaining legal authority from Chelan County to operate a pumper notification program with area septage pumpers as part of its onsite septic system operation and maintenance program. The septage pumpers would work with the CDHD to appropriately identify and correct failing septic systems (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-7:** The CDHD and watershed would benefit from the funding, development and maintenance of a digital system for all onsite septic system permits issued in Chelan County, and a GIS database of the onsite septic systems (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-8:** When the TMDL DIP is developed, the committee should utilize detailed recommendations from the Wenatchee River Watershed Action Plan (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-9:** Conduct stream walk cleanups along the stream (Fall, Spring, Summer) with area schools, homeowners, and other groups (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-10:** Conduct ongoing community fecal coliform education/awareness campaigns throughout the year. Engage and get support from homeowners (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-11:** Work with City, County, State, and Federal governments, and the Humane Society to deal with the feral cats and dogs living within the stream corridor. Monitor and remove dead animals within the stream corridor throughout the year. (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-12:** Conduct education and enforcement actions to stop illegal dumping of wastes either to storm drains or directly to surface waters. This dumping may be of portable toilet wastes, recreational vehicle wastes, etc. (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |

**TABLE 2-11**

**Chumstick Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **ChumQUAL-13:** The WQTS should encourage the CDHD, Chelan County, Cities, DOH, and Utilities to continue ongoing review and upgrading of ordinances regarding developments and sewage systems technologies (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-14:** The WQTS and its participating entities should work with the public and homeowners regarding BMPs to reduce fecal coliform runoff. General actions should include public information, education, and technical assistance regarding watering practices, landscaping, stormwater runoff, filtration practices, animal waste, etc. (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-15:** Work with irrigation districts to implement and enforce policies to prevent illegal fecal coliform discharges to irrigation canals (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-16:** Work with landowners regarding fecal coliform runoff (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-17:** Encourage Chelan County and municipalities to develop and implement stormwater policies, standards, and guidelines, utilizing the Eastern Washington Stormwater Manual or equivalent, in comprehensive plans, critical area ordinances, growth management plans, and other appropriate plans (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-18:** Work with appropriate entities to reduce fecal coliform runoff from impervious surfaces (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-19:** Work with U.S. Forest Service, Washington State Department of Natural Resources, and private owners on forested lands to restore and protect streams from fecal coliform runoff pollution (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| **ChumQUAL-20:** Funding assistance should be sought from Ecology through its grants and loans programs to implement actions and ongoing monitoring. Other funding sources should be identified and applications submitted to provide funding for ongoing activities. The WQTS will recommend qualified entities to conduct associated monitoring. Self-sustaining funding mechanisms to reduce fecal coliform inputs should be explored and developed in concert with the Wenatchee Watershed Planning Unit and its participating entities (WQTS, 2006c). | See Implementation Activities Table in WQTS (2006c) |
| ***Habitat Restoration/Enhancement*** | |
| **ChumH-1:** Re-establish connectivity throughout the assessment unit by removing, replacing, or fixing artificial barriers (culverts and diversions) (UCSRB, 2005). | |
| **ChumH-2:** Use practical and feasible means to increase stream flows (within the natural hydrologic regime and existing water rights) in Chumstick Creek (UCSRB, 2005). | |
| **ChumH-3:** Decrease water temperatures and improve water quality by restoring riparian vegetation along the stream (UCSRB, 2005). | |

**TABLE 2-11**

**Chumstick Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **ChumH-4:** Increase habitat diversity and quantity by restoring riparian habitat, reconnecting side channels and the floodplain with the channel, increasing large woody debris within the channel, and by adding instream structures (UCSRB, 2005). | |
| **ChumH-5:** Protect remaining floodplain and riparian habitat (UCRTT, 2002). | |

**TABLE 2-12**

## Icicle Creek Sub-watershed Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Water Resource Management Strategy*** | |
| **WRMS-4c**: Recommends a new stream gage be established at the existing control point on the Icicle Creek. Details will be determined during Phase IV, Implementation. | Ecology |
| ***DO/pH*** | |
| **IcicleQUAL-1:** The partnership formed to secure funding for further study of DO and pH (Chelan County, Chelan County PUD and the cities of Cashmere, Leavenworth and Wenatchee) should continue to work together, with the WQTS to acquire funding assistance and work with the WQTS to:<br>• Facilitate and develop a workable strategy that can be used and ultimately approved by the EPA and in Ecology's TMDL submittal for DO and pH, and<br>• Review and make suggestions for future improvements to Ecology's technical assessment, summary implementation plan, and adaptive management approaches to meet state water quality standards for these parameters. | Chelan County, Chelan County PUD, Cashmere, Leavenworth, Wenatchee, WQTS |
| **IcicleQUAL-2:** Strategies to address point and non-point sources of phosphorus as part of the TMDL for DO and pH will be reported during the implementation phase of the Wenatchee Watershed planning effort. | |
| **IcicleQUAL-3:** Controls should be developed and implemented through new and existing regulatory permits, if needed, to reduce phosphorous inputs to surface and groundwaters from other Wenatchee Watershed point sources. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-4:** Groundwater discharges to the Wenatchee River, Icicle Creek, and their tributaries affects dissolved oxygen levels and nutrient concentrations. Groundwater is discharged to the river or creeks in some reaches, and is recharged in other reaches. In the Wenatchee basin, groundwater flow and BOD/nutrient concentrations may be elevated due to upland practices such as orchard irrigation and wastewater discharge to groundwater from lagoons and on-site septic systems. Assessments of groundwater contributions and sources of nutrients (phosphorous) should be conducted. Actions should be implemented based on the conclusions and recommendations of these studies to reduce inputs of phosphorous from these areas (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-5:** Non-point sources along the length of the river may be contributing BOD and nutrients. Address failing septic systems through actions identified in the Wenatchee Watershed Fecal Coliform TMDL. Continue site specific inspections and enforcement of regulations that restrict placement of on-site septic drain fields from areas deemed to have unsuitable soils. A study should be conducted to assess soils and onsite septic systems. Estimates should be made of the maximum number and density of on-site drain fields that the upper basin can accommodate and still meet the water quality standards, as was done in the Lake Chelan study (Patmont et al., 1989). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |

**TABLE 2-12**

**Icicle Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **IcicleQUAL-6:** Nutrients (phosphorous) can enter streams from storm water events. Work with Chelan County and municipalities to reduce storm water inputs, utilizing the Eastern Washington Storm water Manual or equivalent. Encourage appropriate entities to include language that addresses storm water in comprehensive plans and ordinances. Work with developers. (See IcicleQUAL-15). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-7:** Nutrients (phosphorous) can enter surface and ground water from residential yards and gardens, hobby farms, City and County Parks, business owned landscapes, etc. An education outreach plan should be developed and implemented to heighten awareness and reduce inputs from these sources. Policies and practices should be implemented in City and County Public Works departments. The County and cities should consider implementing a ban on the sale of high phosphate detergents, such as is being considered in Spokane. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-8:** Nutrients can enter streams from materials used to de-ice, clean, and maintain roads and parking lots. Animal waste from roads and parking lots can enter streams and increase nutrient loading. Work with the County, cities, and businesses to determine if road and parking lot maintenance practices may be contributing to nutrient loading and if necessary investigate ways to reduce nutrient inputs from these practices. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-9:** Nutrients (phosphorous) can be released to ground and surface waters from development practices, such as disruption of soils during conversions of orchard lands to housing. Actions should be conducted to prevent nutrients from entering ground and surface waters before, during and after construction. Work with developers to implement these actions. Encourage entities to include appropriate language in county and city comprehensive plans, growth management, and critical area ordinances. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-10:** Consider implementing actions recommended in the Wenatchee River Basin Temperature and Fecal Coliform TMDLs if the actions address problems that have been identified in the Icicle Sub-watershed. Lowering temperatures and reducing nutrient inputs will improve pH and dissolved oxygen levels in the Wenatchee River Watershed (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-11:** Reserve load capacities for Biochemical Oxygen Demand (BOD) and nutrients should be established for the Upper Wenatchee River and Icicle Creek. Reserve load capacities are needed because there is no additional assimilative capacity for dissolved oxygen in the upper watershed during critical conditions. A point source regulatory strategy and nonpoint source BMP strategy should be developed to protect the reserve capacities and maintain water quality standards (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-12:** Encourage lining of earthen canals where appropriate. Work with irrigation districts to implement BMPs and adaptive management programs to minimize any nutrient loading that is not already being addressed (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |

**TABLE 2-12**

**Icicle Creek Sub-watershed Recommended Actions**

| Recommended Action | Responsible Entity |
|---|---|
| **IcicleQUAL-13:** Agricultural practices can contribute nutrients to ground and surface waters through crop watering practices, application of fertilizers, and soil disturbance activities. Work with the agricultural community to encourage practices that will reduce nutrient inputs to ground and surface waters while enhancing crop quality and yield. Examples include technical assistance through farm plans and Best Management Practices (BMPs). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-14:** Funding for these projects should be sought through Department of Ecology Centennial and 319 grants and loans. Identify and access other funding sources through the Planning Unit and other entities. Ongoing adaptive management should be utilized to provide the best use of funds and environmental benefits (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-15:** Proper filtration of nutrients through land use practices can have a beneficial effect on nutrient reductions to ground and surface waters. Encourage implementation of wetlands, filter strips, riparian vegetation, bio-swales, drainage basins, pervious surfaces, etc. in residential, commercial, agricultural, industrial, development, and municipal practices. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **IcicleQUAL-16:** Identify and investigate any non point sources in tributaries that may be contributing to nutrient loads (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| ***Habitat Restoration/Enhancement*** | |
| **IcicleH-1:** Increase connectivity by improving fish passage over Dam 5 in the lower Icicle Creek (UCSRB, 2005). | |
| **IcicleH-2:** Reduce sediment recruitment by restoring riparian vegetation between the mouth of the Icicle and the boulder field (RM 0-5.4) (UCSRB, 2005). | |
| **IcicleH-3:** Improve road maintenance to reduce fine sediment recruitment in the upper watershed (UCSRB, 2005). | |
| **IcicleH-4:** Increase habitat diversity and quantity by restoring riparian vegetation, reconnecting side channels, and reconnecting the floodplain with the channel in lower Icicle Creek (UCSRB, 2005). | |
| **IcicleH-5:** Use practical and feasible means to increase stream flows (within the natural hydrologic regime and existing water rights) in Icicle Creek (UCSRB, 2005). | |
| **IcicleH-6:** Protect remaining floodplain and riparian habitat downstream of Chatter Creek. Emphasis should be placed on habitat downstream of Leavenworth Hatchery (UCRTT, 2002). | |

**TABLE 2-13**

## Upper Wenatchee River and Chiwaukum Creek Sub-watersheds Recommended Actions

### Upper Wenatchee

| Recommended Action | Responsible Entity |
|---|---|
| ***DO/pH*** | |
| **UpWenQUAL-1:** The partnership formed to secure funding for further study of DO and pH (Chelan County, Chelan County PUD and the cities of Cashmere, Leavenworth and Wenatchee) should continue to work together, with the WQTS to acquire funding assistance and work with the WQTS to:<br>• Facilitate and develop a workable strategy that can be used and ultimately approved by the EPA and in Ecology's TMDL submittal for DO and pH, and<br>• Review and make suggestions for future improvements to Ecology's technical assessment, summary implementation plan, and adaptive management approaches to meet state water quality standards for these parameters. | Chelan County, Chelan County PUD, Cashmere, Leavenworth, Wenatchee, WQTS |
| **UpWenQUAL-2:** Strategies to address point and non-point sources of phosphorus as part of the TMDL for DO and pH will be reported during the implementation phase of the Wenatchee Watershed planning effort. | |
| **UpWenQUAL-3:** Large reductions of phosphorus inputs are needed from point sources in the Wenatchee River Watershed especially waste water treatment plants (WWTPs). A regulatory strategy should be developed and implemented with WWTPs and Ecology to institute controls over time through NPDES permits that will reduce phosphorous discharges to surface and groundwaters. WWTPs to be addressed include the Lake Wenatchee, Stevens Pass, Leavenworth, Peshastin, and Cashmere waste water treatment plants. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-4:** Controls should be developed and implemented through new and existing regulatory permits, if needed, to reduce phosphorous inputs to surface and groundwaters from other Wenatchee Watershed point sources. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-5:** Groundwater discharges to the Wenatchee River, Icicle Creek, and their tributaries affects dissolved oxygen levels and nutrient concentrations. Groundwater is discharged to the river or creeks in some reaches, and is recharged in other reaches. In the Wenatchee basin, groundwater flow and BOD/nutrient concentrations may be elevated due to upland practices such as orchard irrigation and wastewater discharge to groundwater from lagoons and on-site septic systems. Assessments of groundwater contributions and sources of nutrients (phosphorous) should be conducted. Actions should be implemented based on the conclusions and recommendations of these studies to reduce inputs of phosphorous from these areas (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-6:** Non-point sources along the length of the river may be contributing BOD and nutrients. Address failing septic systems through actions identified in the Wenatchee Watershed Fecal Coliform TMDL. Continue site specific inspections and enforcement of regulations that restrict placement of on-site septic drain fields from areas deemed to have unsuitable soils. A study should be conducted to assess soils and onsite septic systems. Estimates should be made of the maximum number and density of on-site drain fields that the upper basin can accommodate and still meet the water quality standards, as was done in the Lake Chelan study (Patmont et al., 1989). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |

**TABLE 2-13**

## Upper Wenatchee River and Chiwaukum Creek Sub-watersheds Recommended Actions

### Upper Wenatchee

| Recommended Action | Responsible Entity |
|---|---|
| **UpWenQUAL-7:** Nutrients (phosphorous) can enter streams from storm water events. Work with Chelan County and municipalities to reduce storm water inputs, utilizing the Eastern Washington Storm water Manual or equivalent. Encourage the appropriate entities to include language that addresses storm water in comprehensive plans and ordinances. Work with developers. (See UpWenQUAL-16). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-8:** Nutrients (phosphorous) can enter surface and ground water from residential yards and gardens, hobby farms, City and County Parks, business owned landscapes, etc. An education outreach plan should be developed and implemented to heighten awareness and reduce inputs from these sources. Policies and practices should be implemented in City and County Public Works departments. The County and cities should consider implementing a ban on the sale of high phosphate detergents, such as is being considered in Spokane. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-9:** Nutrients can enter streams from materials used to de-ice, clean, and maintain roads and parking lots. Animal waste from roads and parking lots can enter streams and increase nutrient loading. Work with the County, cities, businesses, and the WA State Department of Transportation to determine if road and parking lot maintenance practices may be contributing to nutrient loading and if necessary investigate ways to reduce nutrient inputs from these practices. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-10:** Nutrients (phosphorous) can be released to ground and surface waters from development practices, such as disruption of soils during conversions of orchard lands to housing. Actions should be conducted to prevent nutrients from entering ground and surface waters before, during and after construction. Work with developers to implement these actions. Encourage entities to include appropriate language in county and city comprehensive plans, growth management, and critical area ordinances. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-11:** Consider implementing actions recommended in the Wenatchee River Basin Temperature and Fecal Coliform TMDLs if the actions address problems that have been identified in the Upper Wenatchee Sub-watershed. Lowering temperatures and reducing nutrient inputs will improve pH and dissolved oxygen levels in the Wenatchee River Watershed (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-12:** Reserve load capacities for Biochemical Oxygen Demand (BOD) and nutrients should be established for the Upper Wenatchee River and Icicle Creek. Reserve load capacities are needed because there is no additional assimilative capacity for dissolved oxygen in the upper watershed during critical conditions. A point source regulatory strategy and nonpoint source BMP strategy should be developed to protect the reserve capacities and maintain water quality standards (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-13:** Encourage lining of earthen canals where appropriate. Work with irrigation districts to implement BMPs and adaptive management programs to minimize any nutrient loading that is not already being addressed (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |

**TABLE 2-13**

## Upper Wenatchee River and Chiwaukum Creek Sub-watersheds Recommended Actions

### Upper Wenatchee

| Recommended Action | Responsible Entity |
|---|---|
| **UpWenQUAL-14:** Agricultural practices can contribute nutrients to ground and surface waters through crop watering practices, application of fertilizers, and soil disturbance activities. Work with the agricultural community to encourage practices that will reduce nutrient inputs to ground and surface waters while enhancing crop quality and yield. Examples include technical assistance through farm plans and Best Management Practices (BMPs). Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-15:** Funding for these projects should be sought through Department of Ecology Centennial and 319 grants and loans. Identify and access other funding sources through the Planning Unit and other entities. Ongoing adaptive management should be utilized to provide the best use of funds and environmental benefits (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-16:** Proper filtration of nutrients through land use practices can have a beneficial effect on nutrient reductions to ground and surface waters. Encourage implementation of wetlands, filter strips, riparian vegetation, bio-swales, drainage basins, pervious surfaces, etc. in residential, commercial, agricultural, industrial, development, and municipal practices. Conduct associated monitoring and adaptive management (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| **UpWenQUAL-17:** Identify and investigate any non point sources in tributaries that may be contributing to nutrient loads (WQTS, 2006a). | See Implementation Activities Table in WQTS (2006a) |
| ***Habitat Protection*** | |
| **UpWenH-1:** Increase habitat quantity in the Wenatchee River between Tumwater Canyon and Lake Wenatchee by restoring riparian habitat along the river and reconnecting side channels (where feasible) (UCSRB, 2005). | |

### Chiwaukum

| Recommended Action | Responsible Entity |
|---|---|
| ***Habitat Protection*** | |
| **ChiwaukumH-1:** Increase connectivity along Skinney Creek (UCSRB, 2005). | |
| **ChiwaukumH-2:** Increase habitat diversity in Chiwaukum Creek along Tumwater Campground by restoring riparian vegetation, reconnecting the floodplain with the stream, and by increasing large woody debris within the channel (UCSRB, 2005). | |

**TABLE 2-14**

## Chiwawa River Sub-watershed Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Water Resource Management Strategy*** | |
| **WRMS-4d**: Review the gage location on the Chiwawa River as related to the impacts on flows from withdrawals. | |
| ***Habitat Protection*** | |
| **ChiwawaH-1:** Increase habitat quantity by restoring riparian habitat along the lower 4 miles of the Chiwawa River (UCSRB, 2005). | |
| **ChiwawaH-2:** Reduce sediment recruitment to the stream by improving road maintenance within the watershed (UCSRB, 2005). | |
| **ChiwawaH-3:** Improve fish passage in tributaries (UCSRB, 2005). | |
| **ChiwawaH-4:** Protect remaining floodplain and riparian habitat, particularly around Chikamin Flats (UCRTT, 2002). | |

**TABLE 2-15**

## Nason Creek Sub-watershed Recommended Actions

| Recommended Action | Responsible Entity |
|---|---|
| ***Habitat Restoration/Enhancement*** | |
| **NasonH-1:** Re-establish connectivity throughout the assessment unit by removing, replacing, or fixing artificial barriers (culverts) (UCSRB, 2005). | |
| **NasonH-2:** Increase habitat diversity and natural channel stability by increasing in-channel large wood complexes, restoring riparian habitat, and reconnecting side channels, wetlands, and floodplains to the stream (UCSRB, 2005). | |
| **NasonH-3:** Improve road maintenance to reduce fine sediment recruitment to the stream (UCSRB, 2005). | |
| **NasonH-4:** Reduce high water temperatures by reconnecting side channels and the floodplain and improving riparian habitat conditions (UCSRB, 2005). | |
| **NasonH-5:** Protect remaining floodplain and riparian habitat (UCRTT, 2002). | |

# TABLE 2-16

## White River, Little Wenatchee River, and Lake Wenatchee Sub-watersheds Recommended Actions

### White River

| Recommended Action | Responsible Entity |
|---|---|
| ***Habitat Protection*** | |
| **WhiteH-1:** Increase habitat diversity within the lower 2 miles of the White River by reconnecting the floodplain and wetlands to the river (UCSRB, 2005). | |
| **WhiteH-2:** Protect stream channel, riparian, and floodplain functions. Focus on Panther Creek downstream to mouth (UCRTT, 2002). | |
| **WhiteH-3:** Protect shorelines along Lake Wenatchee near White River mouth (UCRTT, 2002). | |

### Little Wenatchee River

| Recommended Action | Responsible Entity |
|---|---|
| ***Habitat Protection*** | |
| **LitWenH-1:** Reduce sediment recruitment to the stream by improving road maintenance within the watershed (UCSRB, 2005). | |
| **LitWenH-2:** Protect stream channel, riparian, and floodplain functions; focus on Little Wenatchee River falls downstream to mouth (UCRTT, 2002). | |

### Lake Wenatchee

| Recommended Action | Responsible Entity |
|---|---|
| ***Habitat Protection*** | |
| **LkWenH-1:** Protect remaining near shore habitat, and develop a means to reduce impacts of bulkheads (UCRTT, 2002). | |