

## SECTION 4: DATA GAPS/RECOMMENDATIONS

### 4.1 INTRODUCTION

---

Eventually a plan for long term protection or restoration of water quantity, quality, and fish habitat will be developed for the Chehalis Basin watershed. This will require; assessing water resources with respect to projected growth and use in the basin, managing groundwater withdrawals, evaluating the potential for flow augmentation, and selecting areas to target for water quality or fish habitat improvement. It will also require prioritizing amongst and between these issues.

To make these decisions, the CBP will need to understand on a subbasin level; the interaction of groundwater and surface water, the relationship among water rights and existing and predicted water use, and the relationships between water quality, quantity, and fish habitat and their priority in each subbasin. This Level 1 Assessment provides a synthesis of available information and preliminary analysis. The next step will be to prioritize subbasins for further assessment and define the data gaps or recommendations that are critical to that subbasin. Then a more rigorous and focused assessment of the key issue(s) can be completed at a scale more appropriate for decision making.

The following is a summary of the key data gaps and recommendations identified during the Chehalis Basin Level 1 Assessment. Recommendations for Level 2 Assessment are generally based on an identified data gap. However, not all data gaps identified have been listed as a recommendation for a Level 2 Assessment. As described at the conclusion of the previous chapter, assessment at the subbasin scale is much more appropriate for the Chehalis Basin. Likewise, the importance or priority given to a data gap or recommendation is highly dependent upon the subbasin being described. As a consequence the following is general in nature. Terms such as “may” or “could” are used because the significance of the data gap will vary widely by subbasin.

### 4.2 GEOLOGY AND HYDROLOGY

---

#### 4.2.1 DATA GAPS

##### **Geology**

In the Chehalis Basin there is an increasing human reliance on groundwater and a growing recognition of the importance of groundwater in supporting stream flow. Information on groundwater and surface water interactions in the Chehalis would greatly increase our knowledge of the potential impacts of ground water withdrawals at the subbasin or basin scale. These interactions have been documented in portions of the Black and Middle Chehalis Rivers, and Scatter Creek, but not elsewhere in the Chehalis Basin. Due to the discontinuous nature of confining lenses within the glacial/alluvial deposits found in valley bottoms, interaction between

surface and shallow groundwater bodies is variable. The nature of the surface deposits in the major river valleys suggests a high degree of ground/surface water continuity throughout the basin but much diversity, with respect to discharge/recharge timing, volumes and relative contribution to surface flows, between and within these valleys.

### **Hydrology**

Hydrologic analyses rely heavily on time series of streamflow data and the Chehalis Basin is fortunate to have numerous streamflow stations distributed throughout the basin. However, 5 of the 30 subbasins do not have any record of streamflow in the basin and several others have only a few years of record. Hydrologic analyses can be undertaken in Level 2 to estimate flows in these ungaged subbasins in the absence of collecting new data. Future management decisions however, would be facilitated if streamflow gages were installed or re-instated coincident with the instream flow control points of primary fishery concern.

Insufficient streamflow data existed on the South Bay tributaries (Johns, Elk, Charley) to determine representative unit runoff ranges in the Level 1 assessment. If fishery concerns exist on the South Bay tributaries, more streamflow data would be helpful.

## **4.2.2 LEVEL 2 RECOMMENDATIONS**

### **Geology**

- ◆ Investigate the interaction of groundwater with surface water in portions of the basin that have not been studied. Develop a hydrologic water balance for each subbasin to screen areas for issues related to groundwater and stream flow interactions.
- ◆ The use of three-dimensional modeling may be required on a subset of subbasins. Modeling should focus on subbasins which have: significant groundwater withdrawals, aquifer/geologic systems with some information available, and, which after additional fisheries work, are identified as flow limiting from a habitat perspective.

### **Hydrology**

- ◆ Estimates of undepleted streamflow were developed for 4 of the 30 subbasins; Level 2 efforts should continue developing undepleted streamflows for the remaining 25 subbasins to allow comparison of flow to allocated water. Subbasins should be prioritized for this analysis according to where low flows have been identified as a limiting factor for fish or where instream flows are difficult to meet.
- ◆ Estimates of undepleted flow may require additional investigation into the influence of regulation by upstream dams on the streamflow records, and documentation of the amount of upstream diversions.
- ◆ The analysis of subbasins that were predominately forest indicates that instream flow targets for some basins should be re-examined since these targets are not met, or just barely met, by the naturally existing streamflows.

- ◆ More detailed investigation of hydrologic change as affected by land use changes would be beneficial. This investigation should assess the changes in land use and watershed conditions over the length of the gage records as well as against historic (pre-gage) conditions.

## **4.3 WATER RIGHTS/ WATER USE**

---

### **4.3.1 DATA GAPS**

Information regarding water rights in the Chehalis Basin were derived from the WDOE's WRATS and GEOWRATS databases. Short of reviewing each and every water right document, these databases contain WDOE's current state of information on water rights. However, the databases do not contain some critical information on allocated amounts and withdrawal locations, and, if results from other basins in Washington State are an indicator, the database can be incomplete (i.e. does not contain some water rights that exist on paper). Additionally, locating water right diversions/withdrawals based on the Q/4-Q/4 section (as in the WDOE databases) is inexact and actual withdrawal or diversion locations are sometimes undefined. In subbasins where allocation amounts are high (e.g. Newaukum), it may be prudent to conduct a detailed mapping of the water rights, including point of diversion and place of use based on the detailed legal description recorded on the actual water right documents.

There is also a lack of information pertaining to actual water use; actual use numbers are generally not available and therefore, the estimates used in this document were based on numerous assumptions, which yielded coarse-scale estimates. This may be especially important for the larger rights holders or those that have been identified as having unusually high allocated or unused amounts, such as irrigators.

An additional data gap is the service area boundaries for the public water systems serving populous within the Chehalis Basin.

### **4.3.2 LEVEL 2 RECOMMENDATIONS**

- ◆ Focus the next phase of assessment on subbasins where potential exists for flow augmentation. For example, in areas where agricultural uses are on the decline, there may be some rights that can be relinquished or conservation techniques implemented to save water. In subbasins with storage rights or a reservoir, opportunity may exist to augment low flows downstream of the impoundment.
- ◆ Comparison graphs of allocated water (both out-of stream demands and in-stream demands) versus "natural" streamflow are a good tool for prioritizing future efforts. These were completed for the five selected subbasins and revealed that some warrant further investigation (e.g. Newaukum), while others may not require further study (e.g. Chehalis headwaters, and the Humptulips). Comparison of consumptive allocated amounts to monthly exceedance values should be completed for the remaining subbasins to determine the potential for flow enhancement.

- ◆ Refine estimates of actual water use versus water rights. Prioritize by largest rights or those representing 90% of the allocated water. Determine the status of the rights that potentially have not been developed.
- ◆ Obtain service area boundaries for public water systems and plot to determine subbasin location for place of use. Obtain actual use records, if available.
- ◆ Determine the actual irrigated area in each WRIA and in each subbasin by engaging the partnership to assist in developing communication with the farm community. This may require an intensive field and aerial photo survey.
- ◆ Investigate the status of larger rights to understand the actual and consumptive use of the water withdrawn.
- ◆ Conduct additional mapping of water rights for subbasins with larger allocations (e.g. Newaukum).
- ◆ Subbasins undergoing rapid development that also have high agricultural use should be prioritized for detailed water rights analysis. This should include quantifying actual water use in agricultural area, and quantifying exempt well use.
- ◆ Update and revise the WRATS database.

## ***4.4 WATER QUALITY***

---

### **4.4.1 DATA GAPS**

While the Chehalis River watershed is one of the more highly sampled basins in Washington, water quality data (including data that meets the needs for long-term trend analysis) is not available for all subbasins. Due to the diversity of conditions across the basin, water quality in un-monitored subbasins cannot necessarily be extrapolated. Thus, water quality cannot be adequately characterized in many of the subbasins, particularly those in the outer harbor.

The water quality data collected is primarily in the form of “grab” samples that represent one point in time and not necessarily the range of conditions. Data sets with longer periods of record generally compensate for this lack. However, for parameters that experience a critical seasonal or diurnal fluctuation, data may be missing during periods of greatest concern.

The natural impact of the Centralia Reach on downstream water quality and an accurate definition of an expected baseline condition within the reach are currently unknown. Also, monitoring at the Montesano station on the mainstem Chehalis River was interrupted in 1992. This station is particularly critical as it represents the cumulative impacts of activities upriver of most of the tidal influence.

Other data gaps in water quality include; an analysis of Grays Harbor water quality, which was not performed for this Level 1 Assessment, and an analysis of point source loading based on reported discharge characteristics. Also, assessment of additional parameters, such as heavy metals and pesticides, may be beneficial in selected subbasins.

#### **4.4.2 LEVEL 2 RECOMMENDATIONS**

- ◆ Enhance monitoring of water quality in areas where data does not exist or water quality is degraded. Monitoring the water quality of the subbasins that discharge to the south shore of Grays Harbor and updating the monitoring on the Wynoochee and Wishkah Rivers would ensure that basins with higher pollutant yields specified in this study are appropriately identified and prioritized for action.
- ◆ Rank subbasins for prioritization based on level of water quality impairment and relationship with other technical issues.
- ◆ A pollutant yield analysis for priority subbasins should be developed based on more detailed hydrologic assessments. This should be used to identify major pollution sources and prioritize improvement actions.
- ◆ An outcome of the Grays Harbor bacteria TMDL was recommendations for FC bacteria load reductions in rivers that already have quite low concentrations. These recommendations should be examined against other watershed priorities.
- ◆ Prioritize water quality improvement actions and accompany with verification monitoring to demonstrate improvements.
- ◆ Establish long-term water quality monitoring stations in one or two places likely to represent a baseline condition that can be used for comparisons.

#### ***4.5 FISH HABITAT/CHANNEL MODIFICATIONS/STOCKS*** \_\_\_\_\_

Due to the USFWS/WDFW extensive survey of 1,500 stream miles in the Chehalis watershed, as well as available watershed analysis information for some watersheds, only a small number of data gaps were found. Representatives of the co-managers of the fisheries resources and responsible federal agencies (WDFW, Quinault Indian Nation, Chehalis Tribe, USFWS, NMFS) may have identified research and monitoring needs from a fisheries management perspective that are not summarized here. In addition, the Limiting Factors Analysis process will identify data needs for the Chehalis watershed, and make recommendations for further data collection. This section should be seen as a contribution to those ongoing efforts, not as a summary of them.

### **4.5.1 DATAGAPS**

Smaller scale modifications such as riprap are difficult to detect from aerial photos. Additional field work and historical trends photo analysis would greatly increase knowledge concerning channel processes and conditions.

Little information was found regarding current habitat conditions and trends for the South Bay tributary streams (which include Andrews, Elk and Barlow Creeks, the Johns and Newkah Rivers, O'Leary, Indian, Stafford, Chapin and Charley Creeks), or the Wishkah and Hoquiam Rivers and their tributary streams. Some historic information was available for each of these systems. An initial assessment of current habitat conditions, problems, and opportunities should be made in order to assist in identification and prioritization of restoration efforts.

Information exists regarding formerly connected side channels, wetlands, and sloughs in the lower Chehalis mainstem, Wynoochee and Satsop floodplains. This information has been used to identify and prioritize habitat improvement projects. If a similar survey took place in the mainstem Chehalis, for instance between Satsop and Doty, additional opportunities for reconnecting of formerly connected channels or wetlands, or other habitat improvements, may be identified.

### **4.5.2 LEVEL 2 RECOMMENDATIONS**

- ◆ An assessment of current habitat conditions, problems, and opportunities, for the South Bay tributary streams, the Wishkah and Hoquiam Rivers, would be an asset to identification and prioritization of restoration efforts. Data collection should be focused on areas where potential restoration actions are likely.
- ◆ An assessment of formerly connected side channels, wetlands, and sloughs in the mainstem Chehalis River valley and floodplain upstream of the existing survey (Ralph et. al. 1994) could be used to identify additional restoration opportunities such as reconnection of wetlands or channels, as well as other habitat improvements. One area for consideration is the reach between Satsop and Doty.