5 Prioritization of Water Quality

5.1 Water Quality Issues and Concerns

The goal of the prioritization of water quality was to begin the process of ranking subwatersheds in terms of the priority pollutant, *E.coli.* It is important to note, that simply because a subwatershed within the Watershed does not rank as a priority area, does not mean that water quality improvement projects should not take place in that location. The overarching goal of the WMP is to improve water quality in its entirety. Therefore, the prioritization process is a means to highlighting critical subwatersheds and then creating a focused remediation approach.

5.2 Identification of Priority Areas

5.2.1 Method

In order to identify priority areas within the watershed for water quality remediation, creating a baseline prioritization was the first step. This baseline prioritization involved comparing the current collected data: *E.coli* monitoring, source tracking, agricultural practices, macroinvertebrate sampling, sedimentation rates (HIT model) and Total Maximum Daily Load (TMDL) presence.

Once the baseline parameters were established and compared further information was necessary to delineate the extent of priority areas: septic areas of highest likely impact, landscape wetlands functional assessment tool, critical zones within the subwatersheds, and other analysis provided by partnering organizations.

Upon reviewing the described parameters, priority areas of concern were identified. When considering all of the parameters including partner interest and commitment, a phase ranking approach was put into place. Ranking the watershed in terms of phases highlights the priority areas first, but also takes into account that projects enacted across the watershed will have a significant impact as well. Meaning, it is not to say that simply because an area within the watershed does not qualify as a critical areas in terms of *E.coli* concentration, that it is not equally as important to the overarching goal of improving water quality across the watershed.

In theory, attacking the first phase of priority areas (including critical zones) will create the most significant improvement in water quality in the shortest amount of time. This approach is helpful when considering organization capacity and funding as well.

Phases are defined in terms of time (years):

First Phase: 1 to 3 years

Second Phase: 4 to 6 years

Third Phase: 7 plus years

Critical zones have been established within Columbia Creek, Skinner-Extension Drain and Silver Creek subwatersheds to further prioritize implementation. In the future, *E.coli* data collection will allow for the creation of critical zones based on monitoring in the remaining subwatersheds.

Again, it is important to keep in mind that this is not a set-in-stone approach. The following factors may change over time: environmental conditions, partner interest and capacity, stakeholder willingness to adopt water quality improvement practices and funding availability.

5.2.2 Ranking

Ranking subwatersheds within a watershed in regards to water quality issues and concerns is not an easy task. A baseline criterion was addressed within each phase. This was based upon the following logic, within each phase, which parameters are of the highest importance when evaluating each subwatershed against one another.

To address the requirement of ranking subwatersheds the following criteria were used:

- First Phase: **Green**
  - Defining Parameters
    - *E.coli* TMDL
    - High *E.coli* concentrations (exceeding WQS)
    - Source tracking presence (all or a combination of): Equine, Bovine and Human
    - Nine critical zones have been identified
- Second Phase: **Purple**
  - Defining Parameters
    - High livestock density (≥ 12/ sq. mi.)
    - Septic Areas of Highest Likely Impact (HLI) (≥ 20)
    - HIT Model Sedimentation Results
- Third Phase: **Orange**
  - Defining Parameters
    - Other Analysis
    - Absence of TMDL
    - Identifying gaps in data
- *Carrier Creek: **Red***

Carrier Creek currently has a TMDL for Biota. The purpose of the TMDL was to identify an appropriate reduction in sediment loading from existing sources. After the publication of the TMDL (2002) a large scale restoration project was completed to address the issue of sediment loading. Currently there is debate as to the effectiveness of the restoration project. Also, MDEQ has drafted a TMDL for Dissolved Oxygen that would impact portions of Carrier Creek once finalized with EPA. It was determined to highlight Carrier Creek as a special case within the Watershed, therefore, not including it in the ranking process, rather as a stand-alone area.

Wetlands Tool

The LLWFA tool was used to determine potential priority areas for wetland restoration and/or protection. Priority areas were determined by using the following functions: flood water storage, sediment, pathogen restoration (which also takes into account nutrients), and juxtaposition to current/existing wetlands, drains, riparian corridors, and streams. It is important to note that all potential areas identified need to be ground-truthed to determine if the data provided by the tool is up to date and accurate. The goal of using the tool is to identify potential areas to provide a starting point for investigating wetland restoration and/or protection, partner projects, information/education mailings, further septic investigation and livestock and manure management. The wetlands tool plays a role in the ranking process; once the subwatersheds were prioritized, the tool was used to identify areas within each subwatershed.

Other Analysis

Other analysis was primarily provided by county drain commission offices and health departments. Both organizations routinely have staff in the field, observing on the ground conditions and their feedback is another source of information, especially as it relates to failing on-site septics and pinpointing areas with higher rates of failure than others.

Other analysis also includes the results of the Watershed macroinvertebrate sampling.

Table 31. Ranking of Subwatersheds

Subwatershed	TMDL	*E. coli* Results	BST Presence	Septic Areas of HLI	Livestock Density (#/sq. mi.)	Tillage Practices	Sediment (tons/ac/yr)	Wetlands Tool	Other Analysis	Critical Zones
Columbia Creek		Exceeding	Bovine-2, Equine-2, Human-1	56	12.1	NT- 35%, RT- 27.5%, CT- 37.5%	.090	4	Poor-1	1
Skinner Extension Drain	X	Exceeding	Bovine-6, Equine- 6, Human- 0	116	5.175	NT- 35%, RT- 0%, CT- 52.5%	.053	6	Fair-4, Good-2	6
Silver Creek	X	Exceeding	Bovine- 2, Equine- 2, Human- 1	64	0.38	NT- 50%, RT- 0%, CT- 50%	.027	4	Fair-2	2
Winchell and Union Drain		no data	no data	23	20.77	NT- 50%, RT- 30%, CT- 20%	.086	5	Good-2 Suggest high risk for E.coli	TBD
Cryderman Lake Drain		no data	no data	66	17.1	NT- 25%, RT- 12.5%, CT- 62.5%	.077	4	Fair-2 Suggest high risk for E.coli	TBD
Sandstone		no data	no data	81	12.92	NT- 25%, RT- 5%, CT- 70%	.059	6	Good-1, Excellent-1 Suggest high risk for E.coli	TBD

Table 31. Ranking of Subwatersheds

Subwatershed	TMDL	*E. coli* Results	BST Presence	Septic Areas of HLI	Livestock Density (#/sq. mi.)	Tillage Practices	Sediment (tons/ac/yr)	Wetlands Tool	Other Analysis	Critical Zones
Frayer Creek		no data	no data	7	5.605	NT- 22.5%, RT- 22.5%, CT- 55%	.070	2	Fair-2, Good-1 Suggest high risk for E.coli	TBD
Sebewa Creek		no data	no data	19	7.615	NT- 25%, RT- 0%, CT- 75%	.085	1	Fair-1, Good-2 Suggest high risk for E.coli	TBD
Carrier Creek	X	no data	no data	75	no data	no data	.013	0		TBD

Notes:
TMDL: X=yes (*E.coli)* and Carrier Creek= *E.coli,* Biota (Sediment) and Draft Dissolved Oxygen (TSS)
E.coli results: exceeding water quality standard
Source tracking results: species and # of sites with presence
Septic Areas of HLI: HLI= highest likely impact, # of HLI
Livestock Density: agricultural practice survey
Tillage Practices: agricultural practice survey, NT= No Till, RT= Reduced Till, CT= Conventional Till
Sediment: HIT Model Results
Wetlands Tool: # of priority areas
Other Analysis: macroinvertebrates (score and number of sites) and information provided by partner organizations
Critical Zones: based on *E.coli* & BST results