6. Floodplain and Flood Management

1. General Issue Statement

Historically, localized flooding within the watershed has damaged and threatened to damage private properties and public infrastructure. Hydrologic and hydraulic (H&H) model updates using updated rainfall data (i.e., NOAA Atlas 14) indicate that there are now properties with inadequate freeboard, putting them at increased risk of flood damage. The BCWD recognizes that the risk of flooding now and into the future will increase as a result of climate trends and events. Flooding can subject properties to damage (including damage that may not be covered by insurance) and pose health risks when flooding intersects with private well overtopping.

These threats pose unique challenges in the watershed, which contains numerous landlocked basins. The loss of flood storage areas through land and basin alterations. The loss of flood storage areas can increase the frequency, elevation, and duration of flooding and can result in increased impacts to infrastructure, property, as well as the natural environment.

2. Relevance to the District

Flooding is a natural occurrence that is vital to the health of many ecosystems. Natural water bodies and constructed stormwater management facilities within the watershed function as flood storage areas. As Minnesota's climate continues to change, there will continue to be an increase in the frequency of flooding. During the next century, spring rainfall and annual precipitation are likely to increase, and severe rainstorms are likely to intensify. These wetter conditions will result in elevated groundwater levels, which limits stormwater infiltration, thereby increasing the rate and volume of runoff traveling downstream. In addition, alterations to the floodplain or outlets of water bodies or stormwater management facilities can change flooding characteristics and impact properties and natural resources. According to the landlocked basin analysis the BCWD performed in 2016 (using the updated NOAA Atlas 14 Precipitation-Frequency Atlas of the United States), the 33 basins within the watershed that are landlocked for the 100-year, 10-day event may be at an elevated risk for flooding if changes in adjacent land uses cause increased volumes of runoff to enter the basins. Additionally, existing or proposed structures in and around flood storage areas require protection from damage caused by flooding.

3. Sub-Issue Areas

1. Flood Prevention

Maintaining the hydrologic balance of the watershed is critical to addressing impacts of flooding. As precipitation patterns change, the watershed management approach must adapt to promote resiliency.

2. Protection of Flood Storage Areas

The natural process of flooding can threaten public safety, damage private property, and structures if the areas that naturally store floodwaters are filled. Filling of flood storage areas (with earthen fill) increases the frequency of flooding and increases the water surface elevation of a flood.

3. Flood Mitigation and Management of Flood-Prone Areas

Areas prone to flooding as identified in the H/H model such as lands adjacent to lakes, streams, and wetlands or within landlocked basins should be managed to avoid impacts to infrastructure and structures. Development within these flood prone areas can remove critical stabilizing features, such as vegetation and shoreline structure. Instability along the shoreline of streams and lakes leads to negative ecological impacts, such as erosion and loss in biodiversity. Structures should be placed where the risk of flooding is low in order to avoid damage.

4. Policies, Goals, and Implementation

The policies, goals, and implementation items related to these sub-issue areas are summarized in the following tables. The sub-issue area is identified in a heading, followed by a related policy. The goals addressing that policy are lettered and stated, followed by the implementation items for that goal. This format is intended to clearly display how each policy and goal will be addressed.

Table 25. Floodplain Management Policies, Goals, and Implementation Activities

SUB-ISSUE:	**Flood Prevention**	
POLICY:	**BCWD will collect, analyze and publish watershed flooding and rainfall data, including water elevations and other hydrological information to serve as a technical resource for District communities.**	
GOALS		**IMPLEMENTATION ITEM**
A	Operate with the most current data on flooding and	[redacted]

	climate change impacts to water resources and infrastructure	[redacted]
POLICY:	**The BCWD will collaborate with property owners, watershed communities and state and federal agencies to reduce risk of flood damage.**	
GOALS		**IMPLEMENTATION ITEM**
A	Ensure risk and responsibility are assigned to the entity best and most appropriately positioned to manage them.	[redacted]

		[redacted]
POLICY:	**BCWD will plan and implement projects with public and private partners to increase flood resilience** **in the watershed through, for example, regional stormwater management.**	
GOALS		**IMPLEMENTATION ITEM**
A	Increase the use of climate resilient strategies in the watershed	[redacted]
POLICY:	**The BCWD will explore possible capital projects that provide flood storage and hazard mitigation.**	
GOALS		**IMPLEMENTATION ITEM**
A	Contribute to the Lower St Croix 1W1P's runoff retention goal by increasing flood storage across the watershed by 0.4 inches. Add flood storage in the watershed	[redacted]

SUB-ISSUE:	**Protection of Flood Storage Areas**	
POLICY:	**The BCWD is committed to the protection of flood storage areas to reduce the impacts of flooding and promote recharge.**	
GOALS		**IMPLEMENTATION ITEM**
A	Ensure no net loss of flood storage capability within the watershed.	[redacted]
SUB-ISSUE:	**Flood Mitigation and Management of Flood Prone Areas**	
POLICY:	**The BCWD will continue to protect structures and natural communities from flooding exceeding natural water level fluctuations.**	
GOALS		**IMPLEMENTATION ITEM**
A	Assess the potential for flooding properties when evaluating land management activities.	[redacted]
POLICY:	**The BCWD will collaborate with property owners, watershed communities and state and federal agencies to prepare for flooding.**	
GOALS		**IMPLEMENTATION ITEM**
A	Balance prevention and mitigation efforts.	[redacted]

			[redacted]
B	Acquire at-risk properties with opportunities for public co-benefits associated with this Plan's goals.		[redacted]
C	Provide support to property owners' efforts to manage their flood risk.		[redacted]
			[redacted]
			[redacted]
			[redacted]
POLICY:	**The BCWD desires to minimize the risks of flooding associated with land alterations adjacent to landlocked basins.**		
GOALS		**IMPLEMENTATION ITEM**	
A	Minimize the risk of flooding to structures within landlocked basins.		[redacted]
B	Minimize the risk of flooding on downstream properties when outlets are provided for landlocked basins.		[redacted]
			[redacted]

POLICY:	**The BCWD will maintain and enhance existing BCWD capital improvements that provide storage and hazard mitigation.**		
A	Maintain and enhance BCWD projects to provide additional flood-mitigation capacity.		[redacted]

Table 26. Floodplain Management Implementation Activities (from Table 23) addressed by Baseline Monitoring Program

- Implementation activities where costs are identified under the Baseline Monitoring Program:
- Continue to monitor lake levels and shallow aquifer groundwater levels to evaluate conditions that may cause impacts to existing structures - Costs identified in under the Baseline Monitoring Program.
- Maintain BCWD weather station to collect local climate data for modeling efforts.