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3.2. Erosion Prevention and Sediment Control

3.2.1. General Issue Statement

Unless properly managed, land-disturbing activities can intensify erosion and lead to increased transport of sediment into surface waters. Land disturbing activities include both physical changes to land when it is modified by human activity (e.g. agriculture, urban development), but also the introduction of contaminants which alter soil quality such as chlorides. These disturbances alter the soil's structure, functions and values, impacting its resilience to erosion and its ability to retain moisture.

Additionally, periods of drought have the potential to weaken soil structure while more severe rainfall events can accelerate erosion during periods of high flow. Areas with a greater slope and degraded soils pose significant risks to erosion. Riparian areas are most at risk of the impacts of increased erosion and sedimentation through removal and deposition of sediments. Increased erosion can also cause the formation of gullies in areas with unstable soils. Sedimentation in waterways can lead to fish kills, clogged streams, degraded fish and macroinvertebrate habitat, reduced storage volume of reservoirs and reductions in stormwater infiltration by sealing permeable soils.

3.2.2. Relevance to the District

The erosion that occurs naturally throughout the watershed and as a result of land-disturbing activities (e.g. development activity and agricultural activity) has the potential to transport sediment and associated nutrients into the District's surface waters. Waters of particular concern include Brown's Creek, which is impaired for aquatic life due to a lack of cold water fish assemblage. Through the stressor identification process, high suspended solids were identified as one of the primary stressors to the biota in the impaired reach of Brown's Creek. To date the origins of the total contribution of suspended solids to Brown's Creek have not been identified and the District continues to evaluate sources from the landscape as well as near-channel. Several District lakes are impaired due to excess nutrient loading which is associated with erosion as nutrients are generally tied to sediment particles.

3.2.3. Sub-Issue Areas

Existing and Anticipated Erosion Problems

Excessive erosion near the District's water bodies can add sediment and nutrients that degrade water quality. Changes to the District's climate impacting soil moisture (extreme dry periods, intense rain events, and quick snowmelt) and structure are anticipated to accelerate bluff instability and headcutting erosion. Identifying problem areas, performing cost-benefit analyses and implementing long-term solutions can limit the impact of these issues on the quality of the District's waters.

Development Related Land Disturbance

Soil disturbance during development activities can lead to high levels of erosion that result in sudden impacts to downstream water bodies if the sediment is transported offsite. Proper control of sediment and erosion during development activities can limit impacts to downstream resources. Development activities can also lead to an increase in stream velocities which can alter stream geomorphology, accelerating in-stream erosion.

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Agricultural Soil Health Practices

Human activities, such as deforestation, agriculture, and urbanization, have disturbed pre-settlement soils impacting their function and value. This disturbance lowers the resilience of these soils to the flow of water resulting in higher degrees of erosion and sediment transport offsite in more disturbed areas. Efforts to re-establish soil function and value have the potential to control sediment and erosion of disturbed lands limiting effects on downstream resources. Soil health principles including limiting disturbance, armoring soil, increasing plant diversity, maintaining living roots in the ground year-round, and integrating livestock represent approaches intended for agricultural soil improvement which are also applicable to other soils.

~~Agricultural activities regularly cause soil disturbance that can lead to high levels of erosion. If the sediment is transported offsite, the erosion results in impacts to downstream water bodies. Proper control of sediment and erosion on agricultural lands can limit the effect of soil disturbance on downstream resources.~~

3.2.4. 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 ~~141310~~ **141310: Erosion Prevention and Sediment Control Policies, Goals, and Implementation Activities**

SUB- ISSUE: Existing <u>and Anticipated</u> Erosion Problems	
POLICY: Protect the District’s water bodies from the impacts of sedimentation, excessive streambank and shoreline erosion, and adjacent upland erosion.	
GOALS	IMPLEMENTATION ITEM
A Provide long-term stabilization of the five highest priority erosion problem areas through stormwater management and stabilization projects including the establishment of native vegetation.	<u>1</u> <u>1</u> Conduct annual stream channel assessments from the headwaters to the St. Croix River to identify in-stream or near channel instabilities and active headcutting. Conduct Alternating drone flights upstream of Manning Avenue where large wetland complexes occur and foot surveys downstream of Manning Avenue, including the three tributaries south of Brown’s Creek State Trail (South Central, Zephyr, and Long Lake tributaries).walk-through. Evaluate headcutting erosion and develop solutions with project partners.
	<u>2</u> <u>2</u> Utilize the District’s cost-share program to assist in the installation of erosion and sedimentation control by citizens of the District.
	<u>3</u> <u>4</u> Determine sediment and chloride loading rates from the gravel roads and parking lots within the District and work with municipalities and townships to address the issue.
	<u>4</u> <u>5</u> Support partners in addressing bluff instability projects.

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SUB- ISSUE: Development Related Land Disturbance	
POLICY:	The BCWD requires erosion and sediment controls in areas disturbed by development and construction related activities.
GOALS	IMPLEMENTATION ITEM
A	Continue to perform routine site inspections during the construction process to monitor the performance of erosion and sediment control practices.
1	Addressed through administration of the BCWD regulatory standards and criteria.
SUB- ISSUE: <u>Agricultural-Soil Health</u> Practices	
POLICY:	The BCWD is committed to improving soil health recognizing the importance of protecting and improving soil function to enhance water quality, reduce erosion, and build climate resilience. The BCWD encourages the use of stormwater runoff and erosion control best management practices on agricultural lands.
GOALS	IMPLEMENTATION ITEM
A	Limit additional disturbance to soils in areas identified as a higher risk for erosion
	Publicize and share resources from MDA, BSWR, DNR and others containing actions specific to different land types (e.g. residential, commercial, agricultural) to provide easy access to this information
B	Convert ### acres of turf to prairie
	Develop an incentive program to assist property owners with turf conversion to prairie or other non-monoculture species.
	Work with HOAs to pilot turf to prairie conversions in their landscape maintenance processes
	Partner with City Parks departments to pilot rotational livestock grazing of public parks to maintain turf areas.
C	Support WCD efforts to implement solutions to identify erosion control problems.
	Assist agricultural landowners with the implementation of best management practices that improve soil health, retain moisture, and minimize nutrient loss.

Table 15-14-1. Projected Expenditures (in 1,000's), for Erosion Prevention and Sediment Control Practices

Implementation Activities	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	10-Yr. Total
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Conduct assessment of Brown's Creek State Trail to evaluate culvert installations, identify erosion and sediment control issues related to the project and evaluate known areas of concern (e.g. bluff and ravine instabilities in the gorge)	10	--	--	--	--	--	--	--	--	--	10
Total for Erosion and Sediment Control	10	--	--	--	--	--	--	--	--	--	10

Table 164542. Erosion Prevention and Sediment Control Implementation Activities from Table 10 where implementation costs covered under another Issue Category

Implementation Activity	Issue Category where implementation cost is identified (Table #)
Conduct annual stream channel assessments from the headwaters to the St. Croix River to identify in-stream or near channel instabilities.	Stream Management (Table 13)
Prioritize erosion projects based on the terrain analysis conducted in 2016 and implement corrective actions based on prioritization.	Stream Management (Table 13)
Utilize the District's cost-share program to assist in the installation of erosion and sedimentation control by citizens of the District.	Stormwater Runoff Management (Table 5)

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3.8. Ecological Health

Commented [AA103]: Board to consider whether or not to change from "Ecological Health" to "Watershed Health"

3.8.1. General Issue Statement

~~The ecological integrity of Brown's Creek and many watershed lakes, ponds and wetlands has degraded to a point where the resources are not providing their original level of function or value. The restoration and protection of the District's surface water resources requires a healthy watershed where the natural cover supports hydrologic and geomorphic processes, habitat of sufficient size and quality to support native aquatic species and riparian species, and water quality that supports healthy biological communities. The BCWD shares discoveries of unique and sensitive plants and animals to increase awareness of the value of protecting healthy watersheds and improve understanding of management actions needed to avoid adverse impacts.~~

3.8.2. Relevance to the District

~~The BCWD is home to several unique ecosystems which provide habitat for rare and sensitive plant and animal communities. Given the rate at which land use changes have occurred in the eastern part of the Twin Cities Metropolitan Area, the watershed still has a number of high-quality resources which warrant protection.~~

~~To-date the BCWD has~~ focused a significant amount of effort on the protection and restoration of Brown's Creek, a cold-water fishery located on the boundary of the Twin Cities Metropolitan Area. Given its designation as a cold-water fishery, Brown's Creek has been actively managed by the Minnesota DNR as a trout stream and a significant amount of attention has been given to the trout population of the creek. In addition to the trout, the Brown's Creek corridor supports a variety of unique and rare species such as Rainbow Darter (*Etheostoma caeruleum*), Blanding's Turtle (*Emydoidea blandingii*), and coldwater dependent macroinvertebrates extremely unique: the creek is full of fish, frogs, turtles and macroinvertebrates, and the steep topography, geologic setting, and high quality vegetation of the Brown's Creek Gorge supports Walking Fern (*Asplenium rhizophyllum*), Butternut (*Juglans cinerea*), and foraging and nesting habitat for a variety of birds including rare species such as the Louisiana Waterthrush (*Parkesia motacilla*).

~~More recently, the BCWD has been focusing on its lakes, ponds and wetlands. Lake management activities have resulted in the discovery of Snailseed Pondweed (*Potamogeton bicupulatus*), an endangered aquatic plant which indicates the need to better understand the water chemistry of these lakes and the management activities needed to sustain these sensitive species. Similarly, a wetland inventory conducted in 2024 resulted in the discovery of a Cranberry Bog (Northern Shrub Shore Fen) which is home to carnivorous round leaved sundew, bog cranberry, and a continuous carpet of sphagnum moss. The presence of these rare species is an indication of the watershed system's health and should be protected in the future. Environmental stressors such as invasive species and land use conversion threaten terrestrial and aquatic habitat resources, the need for protection by the BCWD as well as private landowners.~~

~~To date, the BCWD has focused its management efforts on impacts related to land use changes in the watershed. Given the changes seen locally, nationally and world-wide, the BCWD is broadening its focus~~

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[by considering impacts related to climate change \(see Table X\) and the benefits a healthy watershed provides to economic and social well-being \(see Table X\).](#)

Table 41. Impacts of climate change on Ecological Health

Impact	Description	Indicators
Extreme Heat	Extreme heat increases evaporation rates, drying up water sources such as ponds, rivers, and wetlands.	<ul style="list-style-type: none"> - Reduced reproductive success: Heat stress can lower reproductive success by reducing the fertility of animals or the survival rates of eggs and offspring. For example, heat waves can cause nest abandonment or reduce the hatching success of eggs in birds, reptiles, and amphibians. - Disruption of aquatic habitats: Reduced water levels in rivers, lakes, and streams can threaten fish and other aquatic organisms, as these species depend on specific water conditions for survival. Warmer water temperatures can also reduce dissolved oxygen levels, stressing or killing aquatic life. - Proliferation of invasive species: Some invasive species, including certain plants, insects, and animals, thrive in hotter conditions and may outcompete native species, altering ecosystems and threatening biodiversity. Invasive insects, such as bark beetles, have devastated forests weakened by heat stress.
Warming winters and fewer days below freezing (32°F)		<ul style="list-style-type: none"> - Increasing presence of species traditionally found further south while traditional northern species die out - Invasive Species Expansion: Fewer cold days can help invasive species, which are often better adapted to warmer conditions, survive and spread. This can have serious consequences for native wildlife by altering habitat structure and resource availability. Accelerated spread of invasive species - Plants and insects that emerge earlier due to fewer cold days may not synchronize with the life cycles of their pollinators or herbivores.

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		<ul style="list-style-type: none"> - Warmer winters with more frequent rain can cause increased soil erosion in upland areas, leading to higher sediment loads in water bodies.
Extreme Precipitation	<p>Washington County has and will continue to experience more wet conditions caused by increased precipitation. Precipitation increases are occurring in each season of the year, with the largest increases in spring and summer. Not only has precipitation increased, but the intensity and frequency of large events have also increased.</p>	<ul style="list-style-type: none"> - Wetland areas or floodplains might become permanently submerged, reducing the amount of usable land for species like small mammals, ground-nesting birds, and reptiles. - Intense rainfall can cause soil erosion, particularly on slopes or deforested areas. Erosion leads to loss of plant cover, which is essential for shelter, food, and nesting for many animals. - Extreme rainfall can lead to streambank erosion, which destroys habitats for aquatic and semi-aquatic animals such as amphibians, fish, and birds. Fish spawning sites can be disrupted as sediment buries eggs or larvae. - Increased water flow in rivers and streams can wash away aquatic organisms, disrupt breeding areas, and destroy the structure of habitats. - Excessive sediment in water can cover the river or lakebed, smothering fish eggs, aquatic plants, and invertebrates that are crucial to the food chain. This degradation can reduce biodiversity and the health of aquatic ecosystems. - Extreme rainfall washes nutrients (like nitrogen and phosphorus from fertilizers) and pollutants (like pesticides, heavy metals, and waste) into water bodies. - Disturbed landscapes and flooded areas can become ideal for invasive species to spread, often outcompeting native plants. - Wildlife and plant species that require specific conditions (e.g., dry soil, stable habitats) may be outcompeted by more generalist species, leading to a decline in biodiversity.
Drought	<p>Extended period(s) of no or minimal precipitation impacting the supply of water</p>	<ul style="list-style-type: none"> - Habitat fragmentation: As animals move to find water, they may cross human-dominated landscapes, leading to more road crossings, vehicle collisions, and habitat fragmentation. - Aquatic ecosystems are especially vulnerable to drought. Reduced water levels and higher temperatures can drastically affect fish, amphibians, and invertebrates.

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		<ul style="list-style-type: none"> - Drought weakens plant root systems, increasing soil erosion and leading to long-term vegetation loss. The loss of vegetation increases soil erosion, which can lead to the degradation of habitats, particularly in areas prone to wind or water erosion. - Drought can lead to long-term shifts in species composition and biodiversity, favoring drought-tolerant species over more sensitive ones. - Soil degradation: Heat and drought can degrade soil health, leading to erosion, reduced fertility, and the loss of organisms that contribute to nutrient cycling. This can have long-term consequences for ecosystem productivity and resilience.
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Table 42. Ecological Health opportunities which intersect with DEI principles

Impact	Description of the Need	How Ecological Health can help
Equitable access to clean water	A healthy watershed ensures that water is clean, reliable, and accessible to all communities, regardless of their socio-economic status, race, or geographic location.	<ul style="list-style-type: none"> - By maintaining clean lakes, ponds, wetlands, streams and groundwater the Brown’s Creek watershed supports basic services that are critical to the well-being of all communities, particularly those that may not have the resources to combat pollution or environmental degradation.
Environmental Justice	Environmental justice seeks to address the unfair distribution of environmental benefits and burdens, particularly for communities that have been historically marginalized or overlooked.	<ul style="list-style-type: none"> - Healthy watershed management can prioritize including voices from marginalized communities, ensuring they have a say in decisions that affect their local environment. This leads to policies that reflect the needs of diverse communities and prevent further environmental inequities.
Inclusive Economic Benefits	Economic disparities are often tied to environmental degradation, with disadvantaged communities being most affected by poor watershed health. Inclusive watershed management can provide economic opportunities for all populations.	<ul style="list-style-type: none"> - Healthy watersheds contribute to healthier ecosystems that can support recreation, tourism, and other economic activities. - Ensuring that water quality improvement projects are implemented equitably and impacts to property values. - Investments in watershed restoration and maintenance can lead to the creation of sustainable jobs, from restoration work to green infrastructure development, benefiting local economies. These jobs should be

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		accessible to underrepresented groups, creating pathways for economic inclusion.
Community Engagement and Empowerment	DEI in environmental planning requires inclusive processes where diverse communities have the opportunity to participate in the design and implementation of watershed management efforts.	<ul style="list-style-type: none"> - Healthy watershed initiatives can actively engage community members from diverse backgrounds in decision-making, planning, and restoration activities. This includes reaching out to underrepresented groups, hosting culturally relevant events, and providing education in multiple languages to ensure that all voices are heard. - Communities that are engaged in watershed health are empowered to take ownership of their local environment. Supporting leadership opportunities within minority and underserved groups ensures that they are involved in the long-term sustainability of their water resources.
Climate Resilience and Vulnerability	Climate change disproportionately affects marginalized communities, who are more vulnerable to extreme weather events, droughts, and flooding—all of which are linked to watershed health.	<ul style="list-style-type: none"> - Healthy watersheds act as natural buffers against the impacts of climate change by regulating water flow, preventing flooding, and maintaining groundwater supplies. Ensuring that these benefits are distributed equitably can help vulnerable communities better withstand the impacts of climate change. - Watershed management plans can focus on areas where communities face the highest risk of climate impacts. By prioritizing these areas, managers can ensure that historically marginalized communities are not left more vulnerable to environmental disasters.
Cultural and Recreational Inclusion	Diverse cultural and recreational needs must be considered in the management of water resources, ensuring that all communities have access to natural spaces that support their well-being and traditions.	<ul style="list-style-type: none"> - Many Indigenous communities and other ethnic groups have deep cultural ties to water bodies and natural ecosystems. A healthy watershed protects these areas, preserving important cultural and spiritual sites. - Healthy watersheds support outdoor recreational activities such as fishing, swimming, and hiking, which should be accessible to all communities. Watershed management can ensure that parks, lakes, and rivers are open and safe for use by all demographic groups, promoting inclusivity in nature-based recreation.
Education and Outreach	Promoting awareness of water issues and stewardship opportunities must reach diverse	<ul style="list-style-type: none"> - Watershed programs can include targeted education efforts that reach diverse communities, particularly those historically

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	audiences to build a more inclusive environmental movement.	excluded from environmental education. Programs in schools, community centers, and local organizations can raise awareness about the importance of water conservation and offer opportunities for all groups to engage in watershed protection. - Ensuring that educational materials and outreach efforts are available in multiple languages and are culturally relevant is critical for engaging diverse communities in watershed health. This fosters a sense of inclusivity and participation in water resource management.
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3.8.3. Sub-Issue Areas

Degraded Fisheries

A healthy fish community is an indicator of resource health, and also an important component to maintaining a ~~high quality~~[high-quality](#) aquatic resource. Environmental stressors continue to threaten the integrity of the watershed’s fish-supporting resources. These stressors can include metals, nutrients, [sediment](#), temperature, and [Aquatic Invasive Species \(AIS\)](#).

~~Maintain Ecological Health /~~ [Protect and Restore the Function that of Upland Areas Provide](#)

~~The BCWD is home to several plant and animal species that are sensitive and valuable from an ecological standpoint. ~~which~~ These plant and animal species are indicators of a healthy watershed which is a reflection of the land use in the rural portions of the watershed, resulting in more intact upland areas.~~ The BCWD intends to [protect and enhance these waterbodies upland areas in order to maximize the ecosystem services \(i.e., soil health improvements, filtration, groundwater recharge, wildlife habitat, rate control\) provided by this part of the landscape.](#)

Invasive Species

[Invasive species continue to spread throughout the region. Some invasive species pose direct risks to water resources within lakes and wetlands, while others pose indirect impacts in upland areas where they impact land cover and soil health. For example, Common buckthorn \(*Rhamnus cathartica*\) negatively impacts the understory which results in soil erosion and soils resulting in increased nutrient and sediment runoff to downstream resources. Managing species that negatively impact the water resources plays an important role in maintaining the ecological integrity of the watershed.](#)

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3.8.4. 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 434299. Ecological Health Policies, Goals, and Implementation Activities

SUB-ISSUE: Degraded fisheries		POLICY: BCWD aims to support a robust and healthy fishery as a vital component to ecological health.	
GOALS		IMPLEMENTATION ITEM	
A	Promote healthy and diverse fish communities represented by species representative of the MNDNR lake or stream classifications	1	Conduct additional sampling on Brown's Creek to determine the population status and distribution of the Rainbow darter in the gorge.
		2	Conduct fish barrier assessment to determine potential for fish passage through 95 / 96 box culverts in 2016, then determine fish passage through remaining road crossings to Manning avenue if no barrier present in the gorge.
		3	Work with the DNR to develop a fish stocking plan
		4	Work with community groups (e.g. Stillwater High School and Trout Unlimited) to develop fish rearing plans
B	TSS loads within the contributing drainage area need to be reduced by 74% on average in order to meet these loading limits. (Brown's Creek TMDL Implementation Plan, EOR, 2012)	1	Annually analyze progress toward the TSS reduction goal based on evaluation of the collected monitoring data (conducted as part of the baseline monitoring program).
		2	SEE IMPLEMENTATION ACTIVITIES IDENTIFIED UNDER BROWN'S CREEK MANAGEMENT PLAN (TABLE 61)
C	Restore impaired lakes so that they meet state standards for total phosphorous, chlorophyll A concentration and Secchi depth.	1	SEE IMPLEMENTATION ACTIVITIES IDENTIFIED UNDER LAKE MANAGEMENT PLAN (TABLE 62)
D	Achieve the TP Load Reduction goal of 148 lbs. established at the Diversion Structure as identified in the McKusick Lake and Lily Lake Management Plans.	1	Re-assess water quality data collected in contributing drainage area to Diversion Structure to evaluate pollutant loading and identify sources.
E	Identify and preserve important aquatic wildlife habitat and fish spawning areas	1	Continue surveys for mussels in the lower gorge, particularly upstream of the 2015 unique Species Inventory survey area. Many riffles in the lower gorge have not been surveyed.
		2	Compile a herptile record database developed from available records and initiate citizen volunteer Amphibian and Reptile Survey.
			Removal of fish barriers?

Commented [AA104]: Mike M - Have we resolved all of these/are any remaining that can feasibly be addressed?

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			Creation of fish refugia?
SUB-ISSUE: Protect and Restore the Function of Upland Areas Maintain Ecological Health			
POLICY: The BCWD is committed to maintaining the ecological integrity and connectivity of intact ecosystems.			
GOALS		IMPLEMENTATION ITEM	
<p>Achieve a healthy and diverse community of native plants and animals (City of Stillwater Lake Management Plans, Wenck Associates INC, 2007)</p> <p>B <u>OR</u></p> <p>A</p> <p>Preserve, conserve, and restore natural resources by implementing sustainable practices that promote biodiversity and healthy ecosystems (Washington County Natural Resource Systems Framework).</p>	1	Implement native plant community preservation and restoration projects utilizing the District’s land protection priorities.	
	2	Enhance the management of the BCWD's ecosystem services by implementing pollinator conservation strategies (e.g. recognize and support exemplar projects which restore and enhance habitat for pollinator species, work with road authorities to control invasives and promote establishment of pollinator species, work with county and municipalities to develop mowing plan and schedule that is more conducive to stormwater management and pollinator species)	
	3	Work with the City of Stillwater and area residents to conduct ongoing monitoring of the oak forest found on the west side of Long Lake (identified as a Rare Feature) to evaluate its quality, and if any management activities are needed to ensure its sustainability.	
	4	Improve ecosystem services by creating a program that focuses on restoring forests, wetlands, and grasslands to help reduce the impacts of climate change, such as flooding, heat islands, and soil erosion.	
	5	Work with municipalities to establish tree preservation goals and requirements.	
	6	Work with landowners to diversify their woodlands through forest management plans	
<p>B</p> <p>Turf to native plant conversion goal. Enhancing ecosystem services of the landscape. Greater native/natural space vegetation requirement. More resilient landscape for wet/dry conditions.</p>	1	Identify target area and criteria for priority habitat conversion areas.	
	2	Consider rule change to allow credits for turf conversion	
	3	Implement through the cost-share program	
	4	EMWREP education and outreach	
SUB-ISSUE: Invasive Species			
POLICY: The District takes an active role in preventing the spread of invasive species through education, partnerships, monitoring, and invasive species management projects.			
GOALS		IMPLEMENTATION ITEM	

Commented [AA105]: Cross-reference with Erosion and Sediment issue

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A	Initiate and support aquatic invasive species (AIS) management projects on private and public lands where connected to water quality management	1	Continue to monitor aquatic invasive species and implement controls when it's determined to be a water quality issue.
		2	Record the location of terrestrial exotic and invasive species and implement control measures if it's determined to have water quality impacts <u>or threats to native plant communities.</u>
		3	Address aquatic invasive species management by providing education and outreach to residents and individuals recreating in the watershed.
		4	Utilize the cost-share program to assist with invasive species management where there is a water quality benefit <u>and/or co-benefit towards other beneficial goals.</u>
		5	<u>Support initiatives by the County and other regional partners on AIS management.</u>
		6	<u>Education and outreach regarding bait disposal and pet release.</u>
B	Initiate and support terrestrial invasive species management projects on private and public lands where connected to water quality management	1	Conduct on-going vegetation surveys (every five years) to evaluate community quality and invasive species to provide a more robust dataset that can be used to evaluate trends in plant community composition. A minimum of 5 wetland and 5 upland plots should be established for long-term monitoring.
		2	<u>Provide public and private landowners with tools and resources needed to manage existing habitat, improve species diversity, and protect against invasive species, erosion, and overuse (LSCR1W1P).</u>

[\[Turf to native plant conversion image\]](#)

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Table 444334. Projected Expenditures (in 1,000's) for Ecological Health

Implementation Activities	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	10-Yr. Total
Conduct additional sampling on Brown's Creek to determine the population status and distribution of the Rainbow darter in the gorge.	2	--	--	--	2	--	--	--	2	--	6
Continue surveys for mussels in the lower gorge, particularly upstream of the 2015 unique Species Inventory survey area. Many riffles in the lower gorge have not been surveyed.	--	--	2.5	--	--	--	--	--	--	2.5	5
Compile a herptile record database developed from available records and initiate citizen volunteer Amphibian and Reptile Survey.	--	--	--	3.5	--	--	--	--	--	--	3.5
Implement native plant community preservation and restoration projects utilizing District's land protection priorities.	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5
Enhance management of BCWD's ecosystem services by implementing pollinator conservation strategies.	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5
Continue to monitor aquatic invasive species & implement controls when it's determined to be a water quality issue.	--	--	1	1	1	1	1	1	1	1	8
Record the location of terrestrial exotic and invasive species and implement control measures if it's determined to have water quality impacts.	--	--	1	1	1	1	1	1	1	1	8
Conduct on-going vegetation surveys (every five years) to evaluate community quality and invasive species to provide a more robust dataset that can be used to evaluate trends in plant community composition: min. of 5 wetland and 5 upland plots should be	--	--	10	--	--	--	--	5	--	--	15

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Implementation Activities	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	10-Yr. Total
established for long-term monitoring.											
Total for Ecological Health	3	1	15.5	6.5	5	3	3	8	3	7.5	55.5

Table 454433. Ecological Health Implementation Activities from Table 30 addressed by East Metro Water Resource Education Program

Address AIS management by providing education and outreach to individuals recreating in the watershed.

Table 464533. Ecological Health Implementation Activities from Table 30 where implementation costs covered under another Issue Category

Implementation Activity	Issue Category where implementation cost is identified (Table #)
Utilize the District's cost-share program to assist in the implementation of Lake Management Plans through best management practice installation by citizens - Cost identified in Implementation Activity X under Stormwater Management.	Stormwater Management (Table 5)
Re-assess water quality data collected in contributing drainage area to Diversion Structure to evaluate pollutant loading and identify sources.	Stormwater Management (Table 5)
Promote stormwater reuse by working with local businesses, local units of government and Washington County to incorporate BMPs into new development or redevelopment projects.	Stormwater Management (Table 5)
Conduct fish barrier assessment to determine potential for fish passage through 95 / 96 box culverts in 2016, then determine fish passage through remaining road crossings to Manning avenue if no barrier present in the gorge.	Stream Management (Table 13)
Annually analyze progress toward the TSS reduction goal based on evaluation of the collected monitoring data (conducted as part of the baseline monitoring program).	Stream Management (Table 13)
Utilize the cost-share program to assist with invasive species management where there is a water quality benefit.	Stormwater Management (Table 5)

Commented [MM106]: 95/96 box culvert has now been determined to be a seasonal barrier for AOP but fish can move through during flooding events on the St. Croix. There is a potential natural bedrock barrier in the Gorge (velocity barrier?) that might prevent fish from migrating above the Gorge. The Neal Ave box culvert and McKusick culvert barriers were addressed as part of the Brown's Creek Restoration project in 2024). Fish barrier assessment still needed for a few areas within Oak Glen GC and Millbrook where a large beaver dam now exists.

