

City of Marine on St. Croix
Local Surface Water Management Plan

November 14, 2013

Table of Contents

Introduction 2

St. Croix River 3

Streams 3

Wetlands..... 7

Groundwater..... 9

Village Center Comprehensive Plan Addenda 9

Marine on St. Croix Local Surface Water Management Plan Policies 10

Implementation..... 10

Administrative Procedures regarding Carnelian- Marine- St. Croix Watershed District Rules, adopted
March 1, 2010. 14

Attachment 15

Introduction

The City of Marine on St. Croix, established in 1839 as a site for a water-powered sawmill, has not only history tied to the significant water resource of the St. Croix River but present-day culture, respect and pride for our significant natural resources. The St. Croix River, streams, wetlands, forests, prairie and bluffland topography are important to Marine residents and influence all levels of community decision-making.

Marine is required to complete a Local Surface Water Management Plan for approval by the Carnelian-Marine-St. Croix Watershed District (CMSCWD) and in conformity with MN Statutes Section 103B.235 and MN Rules 8410.0160. In order to fulfill these requirements, the City through this Plan and the Memorandum of Understanding between the CMSCWD and the City for Local Water Planning and Regulation (approved by the City Council October 10, 2013), incorporates the CMSCWD Plan, the Northern Washington County Spring Creek Study, the Wetlands Management Plan, and District Rules.

The Carnelian-Marine-St. Croix Watershed District is operated under the authority of Minnesota Statutes Chapter 103B and Chapter 103D to protect and improve the water resources, natural habitat, and personal property within its boundaries; to educate property owners and the community on the value of water resources; and to promote progressive public relationships and interagency consistency. The District is a government agency created in 2007 from the enlargement of the Carnelian-Marine Watershed District to encompass the Marine Watershed Management Organization.

The City of Marine on St. Croix (Marine) is located within the Carnelian-Marine-St. Croix Watershed District (CMSCWD, District). The total area of the District encompasses portions of Grant, Hugo, Marine on St. Croix, May Township, Scandia, Stillwater, and Stillwater Township. Marine is 2,674 acres, comprising about 5.1% of the District, and is located on the far eastern edge and central (north-south) area of the District, bordered to the east by the St. Croix River. Marine does not have any lakes, but has four streams, and Category 1 and 2 wetlands.

Consistency with the City of Marine on St. Croix Comprehensive Plan and Village Center Addenda

The City's Comprehensive Plan, originated in 2007 and 2008, defines Natural Environment Goal 2 "Protect and maintain surface waters including natural wetlands, floodplains, ponding areas, and drainageways." The relevant policy statements, relating to streams, derived from this Goal are:

1. The City will improve the storm water system in the Village Center.
2. The City will encourage rain gardens in an effort to establish a City-wide storm drainage system that promotes storm water infiltration and water quality.
4. The City will continue to review ordinances to ensure the natural drainage systems within the City, including wetlands, ponds, and runoff, will be protected to manage both the the quantity and quality of the City storm water. The City will require new

development to manage storm water runoff in a manner that limits post development storm water flows to the same volumes and rates as the pre-development condition.

9. The City will work cooperatively with the Carnelian Marine Saint Croix Watershed District and Washington County to achieve the goals of improved stormwater management and water quality throughout the watershed.

The implementation section in the 2008 Comprehensive Plan contains the following paragraph:

The City will address its local surface water management plan within two years of the newly created Carnelian Marine St. Croix Watershed District watershed plan. The Watershed District will continue to have permitting authority and the City will continue to cooperate with the Watershed District through development review and the permitting process.

This Local Surface Water Management Plan is consistent with and is an extension of the City of Marine on St. Croix Comprehensive Plan.

St. Croix River

The St. Croix River joins with the Mississippi River at Point Douglas, MN / Prescott, WI and then flows south to the Gulf of Mexico. The Lower St. Croix River was designated as a National Wild and Scenic Riverway by Congress in 1972. The portion of the river given the Wild and Scenic designation extends from its source in Wisconsin to its mouth at Point Douglas, MN/Prescott, WI. In 2000, a Cooperative Management Plan was developed for the Lower St. Croix by the Lower St. Croix Management Commission with the assistance of the Lower St. Croix Planning Task Force. The portion of the St. Croix River that forms the eastern boundary of the CMSCWD is listed on the MPCA Impaired Waters List per Section 303(d) of the federal Clean Water Act. This part of the River is identified as impaired for aquatic consumption by mercury and PCBs. Just downstream of the CMSCWD, the St. Croix River widens to form Lake St. Croix which extends to the confluence with the Mississippi River. Lake St. Croix is listed as impaired for aquatic recreation by excess nutrients.

The St. Croix River is currently classified by the State of Minnesota as an Outstanding Resource Value Water for its water quality, wildness and other benefits. By state statute, new or expanded discharges (changes in volume, quality, location or any other manner) to the St. Croix River must be controlled so as to prevent deterioration in the quality of the St. Croix River (MN Statute 7050.0180 Subp. 9).

Streams

Marine on St. Croix has four major streams identified in the CMSCWD Plan as well as numerous smaller springs and seeps but no lakes. All four streams have a good and very good overall water quality "grade" as determined by the District per the 2010 Plan. However, since that time monitoring of Dunn's Creek has indicated some water quality impacts that are currently under study. The City will work in partnership with the District to address key management

recommendations described by the CMSCWD 2010 Watershed Management Plan. Marine is proud of the condition of our streams and strives to maintain and possibly improve their conditions.

Dunnø Creek

Most of Dunnø Creek is located on the Pine Needles Land Preserve, which was originally the property of James Dunn and today is owned by the St. Croix Watershed Research Station. The 27-acre watershed draining to Dunnø Creek is located within the northern limits of the village of Marine-on-St. Croix. The upper one-third of this watershed includes the Highway 95 right-of-way and several residential homes on large lots, set above the bluff line. The lower two-thirds of this watershed is completely forested and undeveloped, with the exception of a small cabin and access road to a rustic cabin. Dunnø Creek begins at the confluence of two large springs discharging midway between the middle and lower terraces of the St. Croix River. A third spring-fed tributary joins the creek as it flows along the base of the bluff within a mixed hardwood seepage swamp before discharging to the St. Croix River.

The lower portion of Dunnø Creek watershed encompasses the northerly portion of a large mixed hardwood seepage swamp extending, more or less, from the north boundary of the village of Marine-on-St. Croix, to the south of William O'Brien State Park. This mixed hardwood seepage swamp includes numerous, small inclusions of tamarack swamp, rich fen and spring discharge points that support, in addition to Dunnø Creek, several other spring creeks.

This diverse, groundwater-dependent wetland complex is at its highest quality in the vicinity of Dunnø Creek. An excellent quality white pine-mesic hardwood forest is also present along a narrow rock outcrop that borders the bank of the St. Croix River. Although no rare feature records are specific to this area, many of the species of birds noted elsewhere along the river are likely present here. In addition, the Blandingø turtle (*Emydoidea blandingii*) is a state-listed threatened species that may be encountered throughout the watershed. In-stream conditions would support cold water fish species; however none are documented for this stream.

Based on macroinvertebrate data from the 2003 *Lower St. Croix River Spring Creek Stewardship Plan*, Dunnø Creek has a water quality rating of "B." Hilsenhoffø biotic index (HBI) is good, and the data show a decent percent EPT (percent of pollutant intolerant mayflies, stoneflies and caddisflies in the sample) and low dominance of any single species.

Judd Street Creek

Judd Street Creek is located within the southern portion of Marine-on-St. Croix. Judd St. Creek drains from the upper St. Croix River terrace located upslope of Highway 95. From this upper terrace, flows spill down a short slope to the middle St. Croix River terrace along Highway 95. From Highway 95, Judd Street Creek flows approximately one half mile as a ditch to Judd Street.

Much of this section appears to have been routed around residential homes on the west side of Judd Street. Where the stream meets Judd Street, a concrete cistern box collects ground water and contributes additional flows to the creek. Downstream of Judd Street, the stream flows about 150 feet, where it outlets to the St. Croix River. Judd St. Creek receives runoff from a 61 acre watershed.

The upper-most portion of the watershed ends abruptly at the Wisconsin Central Rail. While the topography continues to slope upward, west of the rail (in the general vicinity of Jackson Meadows) the rail grade has interrupted this flow and diverted it towards the Mill Stream watershed. Land use includes hayfields in the upper watershed and residential in the lower watershed.

The middle portion of the watershed, however, is forested. The Judd St. watershed receives groundwater discharges from two groundwater-dependent wetland complexes.

The wetland complex located on the upper St. Croix River terrace is a continuation of the wetland complexes that encompass the Minnow Farm site to the north. The wetland communities present within the Judd Street watershed include mixed hardwood seepage swamp and rich fen. Unfortunately, these wetland communities are dominated by smooth buckthorn (*Rhamnus frangula*) and reed canary grass (*Phalaris arundinacea*), which has substantially lowered the quality of the wetlands. Judd Street Creek flows through a mixed hardwood seepage swamp wetland complex as it crosses Highway 95. This mixed hardwood seepage swamp includes numerous, small inclusions of tamarack swamp, rich fen and spring discharge points that support, in addition to Judd Street Creek, several other spring creeks. No rare feature records are known for this area. Although some fish habitat is present, there are no records of fish for this stream. However, the Blanding's turtle (*Emydoidea blandingii*) is a state-listed threatened species that may be encountered throughout the watershed.

Based on macroinvertebrate data from the 2003 *Lower St. Croix River Spring Creek Stewardship Plan*, Judd Street Creek has a very good water quality rating of A- ϕ . Hilsenhoff's biotic index (HBI) is very good, and the data show a decent percent EPT (percent of pollutant intolerant mayflies, stoneflies and caddisflies in the sample) and richness. Organic enrichment is likely natural from wetlands.

Mill Stream

The Mill Stream watershed is just over 2000 acres. Much of the upper watershed includes small depressions that may only hold water on a seasonal basis. Unless very wet conditions prevail, most of the water within these depressions either infiltrates into the ground or is lost to evapotranspiration. During wet conditions, particularly frozen-ground, snowmelt-runoff periods, these depressions may fill up with enough water to outlet to Mill Stream. This relationship also holds true for the two headwaters lakes, Sand Lake and Hay Lake.

Outflow from Sand Lake through the ephemeral channel within William O'Brien State Park has occasionally occurred in the past. Downstream of the ephemeral channel that outlets from Sand Lake, the perennial portion of Mill Stream starts within a rich fen/cattail swamp located just west of the Park Headquarters. From this northerly point, Mill Stream flows south for about 1.5 miles to the village of Marine-on-St. Croix. Within this 1.5 mile reach, flows increase significantly, as groundwater discharges off the terrace slope located to the west of Mill Stream.

Within the lower-most portion of this reach, DNR Parks has restored wetland communities and approximately 1000 feet of tributary channel that historically flowed to Mill Stream from the numerous springs within this reach. This restoration site, referred to as the Minnow Farm Site, historically consisted of a series of four large ponds and several smaller ponds contained by

berms and water control structures. The ponds were fed by numerous groundwater seeps along the terrace slope to the west.

Downstream of the Minnow Farm Site, Mill Stream is impounded (Upper Mill Pond) behind a concrete weir constructed across what was historically a waterfall. Below the Upper Mill Pond, Mill Stream flows as a high gradient stream over bedrock within a deep valley for several hundred feet. Approximately 200 feet upstream of Highway 95, the gradient of Mill Stream lessens considerably as it flows across the middle terrace of the St. Croix River and through the center of Marine-on-St. Croix. Just above Judd Street, Mill Stream is again impounded behind a concrete weir, forming the Lower Mill Pond. Below the concrete weir, Mill Stream flows under the Brookside Bar and outlets over a second waterfall. Below the second waterfall, Mill Stream flows several hundred more feet through a floodplain forest where it discharges into the St. Croix River.

The watershed of Mill Stream is a diverse mixture of agricultural land, large-lot residential, forest, and woodland and grassland. The lower section of the stream flows through a relatively dense urban community with substantial direct drainage of impervious surfaces, mostly from a combination of residential streets, Highway 95 and CR 4, which all converge near the lower end of the creek and convey storm flows directly to Mill Stream.

Mill Stream is the largest spring creek in the Watershed District in terms of base flow and stream length. Brook Trout (*Salvelinus fontinalis*) are known to occur throughout the entire stream, including the recently restored tributaries on the Minnow Farm site. The best habitat, however, is within the lower sections of the creek below the Upper Mill Pond. In particular, the section directly above Highway 95 contains good habitat and contains fish as large as ten inches. The headwaters of Mill Stream within William O'Brien State Park contain a large, groundwater-dependent wetland complex. This wetland complex has probably been ditched and altered from past grazing more than other wetlands in the area. However, some portions of this wetland complex do include good quality tamarack swamp, mixed hardwood seepage swamp and rich fen. Below Highway 95, Mill Stream flows through an additional groundwater-fed wetland complex. This second wetland complex encompasses many of the same wetland types and is generally of higher quality than wetlands within the headwaters. Silting does exist in the Mill Stream and dredging may need to occur in the future to ensure the quality of water and habitat.

Based on macroinvertebrate data from the 2003 *Lower St. Croix River Spring Creek Stewardship Plan*, Mill Stream has a very good water quality rating of ≥ 4 on the Hilsenhoff biotic index (HBI) is very good, and the data show an excellent percent EPT (percent of pollutant intolerant mayflies, stoneflies and caddisflies in the sample) with other values also indicating good stream health. In addition, the Blanding's turtle (*Emydoidea blandingii*) is a state-listed threatened species that may be encountered throughout the watershed.

Marine Landing Creek

Marine Landing Creek is located just north of Marine-on-St. Croix and outlets to the south of Marine Landing. The stream originates from a series of seeps located at the ridge line along Highway 95. The watershed area is about 36 acres in size, of which approximately 50% is residential land use

The remaining area of the watershed is forested with some areas of open wetland/old field. Marine Landing Creek is one of the shorter streams in the study area, extending approximately 300 feet from its start, just north of the driveway into the Marina to the St. Croix River.

Marine Landing Creek outlets from a hardwood seepage swamp extending, more or less, from the north boundary of the Village of Marine-on-St. Croix to the south of William O'Brien State Park. This mixed hardwood seepage swamp includes numerous, small inclusions of tamarack swamp, rich fen and spring discharge points that support several other spring creeks.

Although no rare feature records are specific to this area, many of the species of birds noted elsewhere along the river are likely present here. The Blanding's turtle (*Emydoidea blandingii*) is a state-listed threatened species that may be encountered throughout the watershed.

Based on macroinvertebrate data from the 2003 Lower St. Croix River Spring Creek Stewardship Plan, Marine Landing Creek has a very good water quality rating of "A". Hilsenhoff's biotic index (HBI) is good, and the data show an excellent percent EPT (percent of pollutant intolerant mayflies, stoneflies and caddisflies in the sample) with other values also indicating good stream health.

Wetlands

The CMSCWD 2010 Watershed Management Plan includes a Wetland Management Plan, adopted with the District Plan in 2010. The purposes of the Wetland Management Plan is to evaluate the wetland resources of Carnelian-Marine-St. Croix Watershed District (CMSCWD), describe the approach to protecting the functions and diversity of the district's wetlands, and lay the groundwork to improve these resources.

The main emphasis of the Carnelian-Marine-St. Croix Watershed District is the "protection and improvement of water quality" and according to their Second Generation Plan, CMSCWD operates "with intent to protect and improve the water resources, natural habitat and personal property within its boundaries; to educate property owners and the community on the value of water resources; and to promote progressive public relationships and interagency consistency." These goals are consistent with the intent of state and federal rules for wetland protection. The strategy for addressing these goals is to evaluate wetland resources on an individual basin scale, and on a watershed scale. The watershed scale of analysis allows ecological functions and values to be realized that are lost at a smaller scale. The Wetland Management Plan provides a mechanism to address local wetland management and preservation of aquatic resource functions and values at an individual wetland scale and a watershed scale.

The City of Marine has two categories of wetlands; Category 1, and in the northern portion of the community, a small area with Category 2 wetland classification.

The District defines the Categories as follows:

Category 1. High Quality/Highest Priority

Wetlands classified as High Quality/Highest Priority have at least one of the following characteristics:

ÉWetlands rated with exceptional vegetative diversity/integrity, which may include wetlands with natural communities not significantly impacted by invasive species or other human-induced alterations, wetlands harboring endangered or threatened plant species, or rare wetland habitats classified as imperiled (S1) or critically imperiled (S2) by the state rankings.

ÉWetlands that are groundwater dependent plant communities and have a vegetative diversity/integrity rating of medium or higher were also placed in this category. These wetlands may have suffered some degradation from human influences due to their heightened sensitivity.

ÉWetlands with a high vegetative diversity/integrity rating and a high rating for hydrologic regime. The vegetative community in these wetlands typically has been only slightly affected by humans and still maintains high functioning levels for hydrologic regime, which is critical to wetland sustainability.

ÉWetlands with a high vegetative diversity/integrity rating and a high rating for wetland water quality; OR wetlands with a high vegetative diversity/integrity rating and a high rating for downstream water quality. The vegetative community in these wetlands typically has been only slightly affected by humans and still maintains high functioning to maintain water quality, which is critical to wetland sustainability.

ÉWetlands rated as exceptional for wildlife habitat. These include wetlands known to harbor endangered or threatened animal species, rare communities, or wildlife refuges and fish and wildlife management areas whose purpose is maintaining suitable habitats for wildlife.

Category 2. Stream Corridor and Shoreland Wetlands (that are not a Category 1)
Wetlands classified as Stream Corridor and Shoreland Wetlands have at least one of the following characteristics:

ÉThese wetlands include all Stream Corridor and Shoreland Wetlands not already classified as Category 1.

ÉWetlands rated as high for amphibian habitat.

ÉWetlands rated as exceptional or high for fish habitat. These wetlands include those specifically managed for fish management; designated trout streams, lakes or adjacent wetlands; and known spawning habitat for game fish.

ÉWetlands with a medium vegetative diversity/integrity rating and a high rating for hydrologic regime. The vegetative community in these wetlands has only been moderately affected by humans and still maintains high functioning levels for hydrologic regime, which is critical to wetland sustainability. These wetlands would likely benefit from active management.

ÉWetlands that are highly sensitive to stormwater impacts and have a vegetative diversity/integrity rating of medium or high were also placed in this category.

ÉWetlands with a medium vegetative diversity/integrity rating and a high rating for wetland water quality. The vegetative community in these wetlands has only been moderately affected by humans and still maintains high functioning levels for water quality, which is critical to wetland sustainability.

Groundwater

The County adopted the *Washington County Groundwater Plan* in December 2003, which is in effect at the time of adoption of the *City of Marine on St. Croix Local Water Management Plan*. However, a *Washington County Groundwater Plan 2014-2024* has been sent to the City of Marine on St. Croix for review. The goal of the Washington County Groundwater Plan (Plan) 2014-2024 is to: *Manage the quality and quantity of groundwater in Washington County to protect health and ensure sufficient supplies of clean water to support human uses and natural ecosystems*. The Plan describes a need for increased coordination and collaboration amongst water management agencies, additional groundwater research, and understanding needs of competing interests for County groundwater. Marine will comment on the Plan with intentions to incorporate by reference the Washington County Groundwater Plan 2014-2024 and include relevant implementation actions from the County Ground Water Workplan into the forthcoming Comprehensive Plan update.

Village Center Comprehensive Plan Addenda

In a parallel planning effort to the development of the Local Surface Water Management Plan, the City of Marine on St. Croix has prepared an addenda to the 2008 Comprehensive Plan focused on the Village Center recognizing four distinguishing factors:

- The identity and character of the historic village (large parts of the City, including the Village Center, are a National Historic District). The Village Center also contains the Marine Mill Site, a National Historic Site based on its history as the first commercial industrial site ó a sawmill - in Minnesota.
- Proximity to the St. Croix River, which borders the Village Center. The St. Croix is protected and enjoyed as a National Wild and Scenic River; the adjoining areas, including the Village Center, are part of the associated Riverway.
- Green space throughout the city. The City, by its topography and development patterns, retains large undeveloped or sparsely developed areas, providing a more human scale and natural appearance as well as protective features for the environment.
- A pervasive community participation and interaction. The Village Center provides spaces for interaction among the local population and also visitors; volunteer participation provides a higher level of services than normally found in like sized communities in the metro area.

A primary goal of the Village Center Plan is to address stormwater quantity and quality within the Village Center prior to discharging to the St. Croix River. Policies of the Addenda reflect a strong commitment to improved stormwater management.

Marine on St. Croix Local Surface Water Management Plan Policies

1. Incorporates by reference the following:
 - a. Carnelian Marine Watershed District 2010 Watershed Management Plan, including the Wetland Management Plan, the Northern Washington County Spring Creek Study, and the District Rules.
 - b. The *Washington County Groundwater Plan*, adopted 2003. And, participate with the CMSCWD in imminent update of the ten-year County Groundwater Plan process.
2. Implementation of CSMCWD Rules in the St. Croix Urban Residential, Single Family Urban and the Village Center zoning districts through a Memorandum of Understanding between the Carnelian-Marine-St. Croix Watershed District and the City of Marine on St. Croix for Local Water Planning and Regulation (see attached).
3. Support the stormwater management Policies described by the Village Center Comprehensive Plan Addenda.
4. Amend local ordinances within six months to ensure local official controls are consistent with District standards and Rules.

Implementation

The City supports priorities identified in the implementation section of the CMSCWD Plan, specifically under Capital Improvement Projects item B. Neighborhood Wide Small Lot Stormwater Management Incentive Program, and Non-Structural Projects and Studies item Highway 95 Wetlands in Marine Management Plan.

Stormwater Management Programs

The City of Marine on St. Croix has identified areas within the adopted District Rules that are problematic in implantation and inconsistent with the existing urban residential areas of our City. However, re-examining the policies derived from a) the Natural Environment Goal 2 of the city's 2008 Comprehensive Plan (above), b) the CMSWD Plan's recommendations for the four major streams in the City (as follows), and c) noting that the historical development of the City placed the greatest density of impervious surfaces adjacent to these streams, it is apparent that runoff from these impervious surfaces into the streams is and has been a factor in maintaining water quality of the streams and ultimately the St. Croix River. Problems and inconsistencies for these urban areas therefore are less in the stated policies and more in defining implementation steps, especially in coordination with the more recent CMSCWD plan.

The Neighborhood Wide Small Lot Stormwater Management Incentive Program supports projects directed towards entire neighborhoods that consist of high-density, single-family residential development. The purpose is to implement stormwater BMPs throughout an entire neighborhood as a community program.

1. The City will direct its surface water management efforts to two control zones within the City; one covering the Single Family Rural and St. Croix Rural zoning districts, and the other covering all other areas of the City which include Single Family Urban, St. Croix Urban, and Village Center zoning districts.
2. In the Single Family Rural and St. Croix Rural zoning districts the City and CMSCWD will administer the CMSCWD Plan and Rules.
3. In the Single Family Urban, St. Croix Urban, and Village Center zoning districts the City will manage surface water issues as enabled by Section 2.7.4 of CMSCWD Rules and the MOU approved by the City Council October 10, 2013.
4. In the Single Family Urban, St. Croix Urban, and Village Center zoning districts the City will place priority on limiting the effects of additional impervious areas thru the mitigation of the surface water flows from those areas, using the provisions of CMSCWD's Neighborhood Wide Small Lot Stormwater Incentive Program.
5. The City, as funds and designs become available, will install run off management structures to protect the streams designated in the CMSCWD Plan.
6. The City will continue ongoing negotiations with MNDOT to facilitate solutions to surface water issues related to or adjacent to TH 95.

Implementation costs paid for through a combination of City funds, District funds and grants. IE: A submitted grant request (October 5, 2013) for Clean Water Fund funding as administered by the Board of Water and Soil Resources. Marine on St. Croix is listed as an example area where the District's Neighborhood Wide Small Lot Stormwater Management Incentive Program may be applicable. The District has budgeted funds for 2014, and 2017 for this effort.

Support for Management Recommendations of Four Streams in Marine on St. Croix

Described by the *CMSCWD Northern Washington County Spring Creek, 2003* for its streams as follows:

A. CMSCWD Plan Key Management Recommendations for Dunn's Creek:

- All existing and new development along the bluffline above Dunn's Creek should limit stormwater runoff to pre-development levels.

- Landowners along the bluffline above the groundwater discharge areas should retain a generous buffer of native vegetation.
- Elevated nitrate and chloride levels in Dunnø Creek suggest that local runoff (from the Marine-on-St. Croix Wastewater Treatment Facility) and impervious roadway surfaces may be impacting water quality. The Watershed (Research Station) may want to monitor water quality in this stream. Note: Since the District adopted this plan in 2010, the City has and continues to monitor the groundwater wells surrounding the City drainfield according to MPCA requirements.

B. CMSCWD Plan Key Management Recommendations for Judd Creek:

- Install rain-water gardens in swales along Judd St. Creek. Because of their visibility, these rain gardens could serve as educational/demonstration sites.
- Where stream-side buffers are lacking or of poor quality, create/improve buffer with plantings of native vegetation.

Within mixed hardwood seepage swamp (between Highway 95 and Judd Street), the City, Watershed and Mill Stream Association should work together to control buckthorn and, where appropriate, reestablish native tree and shrub species. In particular, these efforts should be encouraged along the stream corridors.

C. CMSCWD Plan Key Management Recommendations for Mill Stream:

- Stabilize streambank of Mill Stream on cut bank just above footbridge in Zollerø Ravine.
- Within Zollerø Ravine, establish shade-tolerant understory shrubs and groundcover species to stabilize stream bank and improve fish habitat.
- Encourage landowners to retain woody debris within stream channel to improve fish habitat.
- Within Mill Stream just upstream of Highway 95, place rock or stone deflectors within channel to reverse aggrading.
- The Highway 95 culvert should be replaced, with the upstream and downstream culvert invert placed below the existing stream grade. Alternatively, options to raise the grade of the stream (to reduce the head between the upstream and downstream end of the culvert) should be considered.
- Work with Marine-on-St. Croix and private landowners to create a continuous vegetative buffer of native vegetation between Highway 95 and the Brookside Bar and Grill at Judd Street.
- Work with Marine-on-St. Croix to install stormwater infiltration and rainwater gardens to intercept stormwater runoff that is currently discharging into Mill Stream from impervious surfaces.
- Remove sediment from City Mill Pond and partially route Mill Stream around pond. Install native vegetative buffer around edges of pond.
- Where Mill Stream crosses under Judd Street, install trench drains to intercept stormwater and discharge it to water quality treatment waterway/vegetative swale.

D. CMSCWD Plan Key Management Recommendations for Marine Landing Creek:

- For residential areas draining to Marine Landing Creek, encourage the use of residential rain gardens and vegetated swales to store and convey stormwater. The springs emanate from the middle Mazomanie Facies of the Franconia Formation. The stream also receives surface runoff from the river terraces above.
- Establish stormwater demonstration sites to educate residents on stormwater management BMPs.
- Work with Mn/DOT and the City to control stormwater runoff from residential area and Highway 95. Several areas to the north of Marine-on- St. Croix along Highway 95 could potentially serve as regional infiltration basins. The water is has a low calcium/magnesium ratio, indicating that recharge of the water could be coming from a nearby lake or lakes, possibly in the area of Big Marine Lake.
- The in-slope of Highway 95 is severely eroded in several places. Once #3 is addressed, these areas should be stabilized and restored cooperatively with Mn/DOT and the City of Marine-on-St. Croix Marine Landing Creek.

Implementation costs and technical assistance primarily provided by the CMSCWD in partnership with the City of Marine on St. Croix.

Implementation of Wetlands Conservation Act

The Washington Conservation District (WCD) assists the local Municipalities as the Local Government Unit (LGU) for implementing the Wetland Conservation Act (WCA), which regulates activities having the potential to drain, fill, or alter wetlands.

The City of Marine on St. Croix has identified areas within the adopted District Rules that are problematic to implement and inconsistent with the existing urban residential areas of our City. Due to this unique and historic platting and development, any land parcel occupied by a legally conforming use as defined by the Marine on St. Croix Zoning Ordinance, or having been occupied by such legally conforming use since January 1, 2000, shall be allowed to continue in that use. Existing separation from wetlands of improvements associated with that use or uses shall be allowed to continue but may not be reduced. Existing buffers around wetlands and streams shall be allowed to continue but may not be reduced. In addition, any increase in impervious surface in these areas is subject to the same guidelines for stormwater management mitigation as other uses within the same City zoning district.

Implementation primarily provided by the City of Marine on St. Croix in partnership with CMSCWD.

Development of a Highway 95 Wetlands Marine Management Plan

Marine on St. Croix supports, as described in the CMSCWD Plan under Capital Improvement Projects, the development of a plan to restore or enhance wetland vegetation and the historic hydrology of a wetland complex. Recognizing the plan will need to be sensitive to local homeowners currently experiencing water problems in their buildings.

Implementation costs and technical assistance primarily provided by the CMSCWD in partnership with the City of Marine on St. Croix.

Administrative Procedures regarding Carnelian- Marine- St. Croix Watershed District Rules, adopted March 1, 2010.

1. Permit application or inquiry received.
2. Review to see if CMSCWD Rules will apply. If uncertain, the determination will be made in consultation with the CMSCWD.
3. If no, proceed with normal permit application process without referral to Watershed District.
4. If yes, provide applicant with appropriate information and refer to Watershed District for required permits and process.
5. Issue building permit only after valid watershed permit is received.
6. Issue final certificate of occupancy only after written notice from watershed district that final inspection has been satisfied.

Implementation costs primarily provided by the City of Marine on St. Croix, and when the Rules apply, by the CMSCWD.

Attachment

MEMORANDUM OF UNDERSTANDING

**Between the Carnelian-Marine-St. Croix Watershed District and
the City of Marine on St. Croix for Local Water Planning and Regulation**