Operation and Maintenance Plan for Town Branch Creek Riparian Areas

Water Body: Town Branch Creek (Segment 1810A), a tributary to Plum Creek
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Background & Introduction

The 2020 Texas Integrated Report identified elevated bacteria concentrations and concerns for impaired habitat, nitrates, and total phosphorus in Plum Creek, segment 1810_02. The report also listed Town Branch Creek, segment 1810A, a tributary of Plum Creek, with water quality concerns for bacteria concentrations in excess of the standard as well as excessive nitrate levels.

An evaluation of the riparian functional conditions along Town Branch Creek was included in TCEQ project #18-80212 to help inform creek restoration plans. The evaluation identified opportunities for improved function through the implementation of Best Management Practices (BMPs) designed to address an identified hinderance especially on City owned property with a special focus on two reaches: the Urban Trail Reach and the City Park Reach.

Within the City Park Reach, as recommended a rain garden has been established to temporarily capture and slow runoff from uplands allowing a slower release of stormwater through heavily vegetated riparian areas. Within both reaches, a mowing setback was used to create grow zones that then were augmented by the planting of riparian grasses.

The purpose of this document is to outline maintenance and operation plans for the City owned property along Town Branch Creek and to ensure that the installed BMP's succeed through the future and continue to provide the intended water quality benefits.

Fig 1. Aerial map of Town Branch Creek Identified Reaches showing the Riparian Evaluation Areas highlighted with the two areas where City management prevails circled in red.

Riparian Area Management in General

Guiding Principal – Small yet Special and Need Preferential Treatment

The value of riparian areas in the landscape far exceeds their relatively small size. In most setting riparian areas make up about 1% of the landscape but the ecological, hydrological, economic and human values provided by these areas is comparatively much greater. One guiding principal that needs to be remembered: Riparian areas are special places that need preferential treatment. The same kinds of management that work well on upland areas do not necessarily work well in riparian areas. The management needed in riparian areas is different and distinct and should be specially prescribed and carried out. Describing this kind of care is not easy and requires the manager achieve an understanding of the natural processes involved. One of the primary purposes of this document is the provide a basic understanding of riparian processes and management strategies to City of Lockhart staff to help them take better care of these special places and in-turn shepherd the improvement of water quality in Town Branch Creek.

Basis for Riparian Management

Riparian Function is the cornerstone of sustainable riparian management. It is important for managers to recognize and differentiate between activities that support physical function and those that undermine it. A functional riparian area is one that has adequate vegetation, landform or large woody material to dissipate the energy of high-flow events; protect banks from excessive erosion, stabilize channels; trap sediment; build floodplains; store water and provide recharge to shallow aquifers sustaining base flow (Prichard 1998). When these physical processes are working, good water quality as well as other values like improved aquatic habitat, and aesthetics, can be expected, as results.

Maintaining Equilibrium and Removing Hinderances and Recovery

In a natural setting, and in the absence of significant artificial disturbance most riparian areas maintain themselves in a relatively stable condition known as “dynamic equilibrium”. When various human activities cause severe and prolonged disturbances a creek attempts to accommodate the disruption with an equally severe reaction. Poor riparian function which can result from the accumulated impacts often leads to diminished water quality. Functional conditions typically return once the activity that is hindering that recovery is addressed.

Riparian lands along Town Branch Creek managed by the City of Lockhart are included within two identified creek reaches: The Urban Trail Reach and the City Park Reach. These areas were the focus of an evaluation project in 2018 that identified hinderances to riparian recover. Identified hinderances included:

- Manicured and altered residential or park landscapes next to the waterway
- Mowing too close to the creek
- Artificial manipulation of banks channel or sediments

- Poorly designed road crossing and drainage facilities
- Physical alteration of floodplain

In 2019, the City began implementing BMP's to address identified hinderances. A "grow zone" mowing setback was established along the creek encompassing about 2.43 acres and in 2020, a rain garden was installed to slow runoff from a highly altered area of uplands. Additionally, native riparian vegetation was planted at key sites to help accelerate the recovery process.

Fig 2. Google Earth ™ image of the Riparian Area of Town Branch Creek's City Park Reach highlighted in orange and the rain garden site identified.

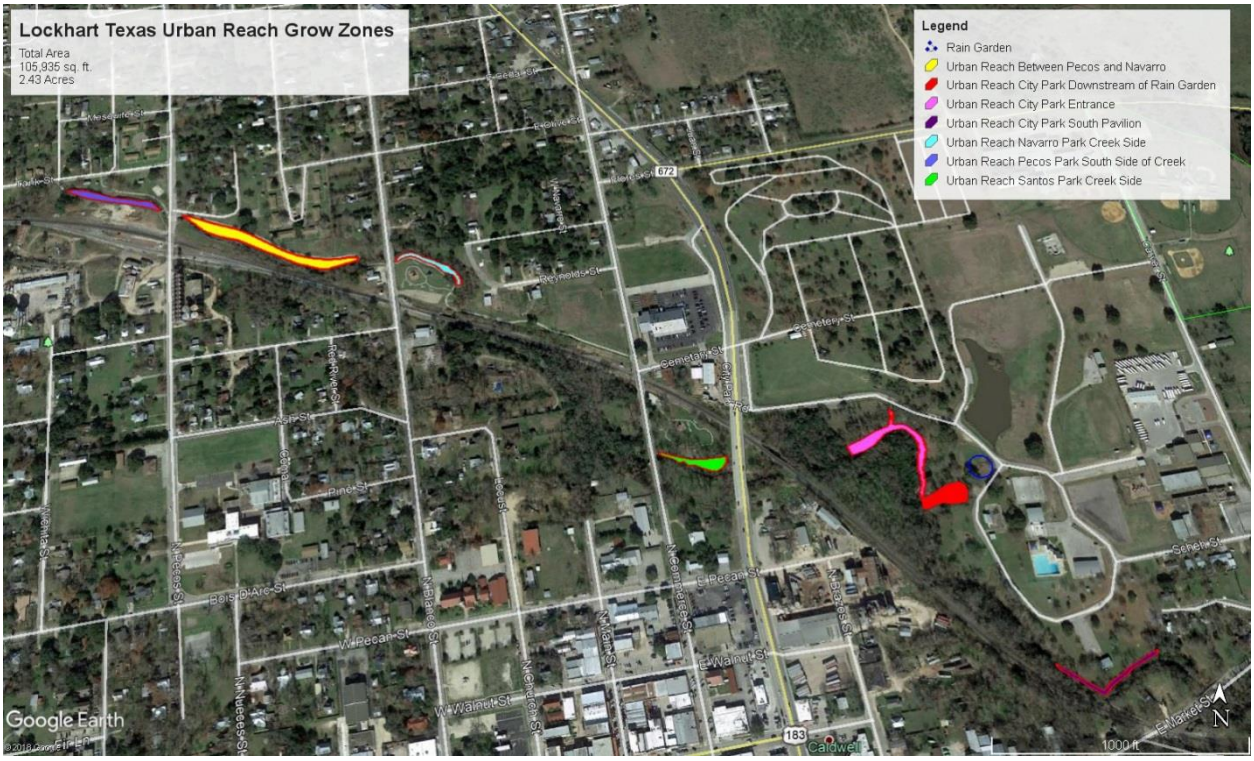

Fig 3. Google Earth ™ image of the Urban Reach of Town Branch Creek with the riparian BMP locations identified. These six established locations are being called "Grow Zones" where mowing setbacks and riparian planting was accomplished totaling 2.43 acres.

Appreciating Riparian Recovery – Watching and Waiting

Patience is a key human attribute in riparian area management. The ability to recognize, appreciate, and communicate with others the riparian recovery process is an important component. Included as an appendix to this document is Your Remarkable Riparian Owner's Manual by Steve Nelle, published by the Nueces River Authority. It provides a common-sense approach to understanding riparian areas and learning to provide the preferential treatment they require to function properly and provide water quality benefits.

Town Branch Creek Riparian Area Management

Riparian Management Strategies for Urban and Recreational Land Uses

The Urban Trail and City Park reaches of Town Branch Creek contain both urban and recreational lands. These can be two of the most challenging land use types for riparian management. Most creeks in urban areas have been altered in one way or another. Removal or alteration of the natural riparian vegetation is common. Increased runoff in urban areas combined with riparian alteration creates a greater risk of erosion during high flow events. Retaining or restoring a buffer of natural vegetation will help maintain a degree of riparian function.

Land that is intensively used for recreational purposes is vulnerable to degradation. Creek areas subject to heavy recreational use can be some of the most abused and degraded riparian areas around. Continual long-term foot traffic often reduces dense riparian vegetation and creates compacted bare ground. Public recreation areas used for hiking, disc golf, fishing, etc. can be degraded by sustained use, but those impacts can be minimized by management.

Operation and Maintenance for the Town Branch Creek Rain Garden and Grow Zones

The following operation and maintenance practices are recommended for use in the rain garden and the grow zones areas.

- Do not mow vegetation within the rain garden or around its periphery or down the drains running from it to the Creek. Remove undesirable plants, if deem necessary, by hand, and/or use selective herbicide application, including Johnson Grass which is known to grow in the drain way.
- Until the May 2021 provide supplemental water as necessary for the establishment of rain garden vegetation. After that time supplemental water should not be required.
- Continue to limit mowing in Grow Zones, hand pulling noxious or unwanted plants and letting native riparian vegetation grow unhindered. See Your Remarkable Riparian Field Guide to Riparian Vegetation within most of Texas, for plant identification.
- Consider enlarging Grow Zones to include more of the Creek's floodplain with the idea of rotating mowed areas to help manage human activity
- Do not remove large logs or dead fallen trees in the creek, along the bank or in the floodplain. Instead leave them as a nursery for new riparian vegetation.
- Vehicle traffic should be minimized, especially in the area below the rain garden crossing the small drain which was the target of riparian plantings.
- New trails should not be aggressively de-vegetated, paved and should not be immediately adjacent or parallel within close proximity to creek.
- Consideration should be given to the repositioning of existing paved trails in the floodplain to include meanders and pervious surfaces.
- Consider establishing (or suggesting) periodic access trails down to the creek which should not be surfaced and should be rotated to the extent feasible.
- Separate heavy use areas with buffers of thick natural vegetation, ie. Disk golf targets and paths not currently included in a grow zone and or relocate golf targets or other heavy use activities to higher ground where feasible.
- Provide educational materials to describe the reasons why these practices are carried out.
- Establish, or use one of the images provided in Your Remarkable Riparian as a visual intention statement for the riparian landscape. Post this image along with this document in City maintenance shop or staff break rooms. Make it also available to City management and elected leaders.

Fig 4. Heron loafing in Town Branch Creek within the City Park Reach. Riparian vegetation in the foreground is beginning its recovery as part of the mowing cessation plan.

Fig 5. Clear water and well vegetated banks in Town Branch Creek downstream of the BMP implementation.