CHAPTER 12

WATERSHED PLANNING AND ANALYSIS: MARYS RIVER

12.1 INTRODUCTION

The Marys River watershed contains three small drainages that lie south of the Corvallis Country Club. The drainages are outside the city limits, but inside the Urban Growth Boundary (UGB). Flows from the drainages run southward underneath Brooklane Drive before entering the Marys River floodplain. The 78 acres of the drainages were modeled from the culverts underneath Brooklane Drive to the top of their drainages at the crest of the hill. The existing land use is split between low-density residential and open space, although the area is undergoing significant development. In the future, low-density residential will cover 69 acres, with the rest preserved with an open-space conservation designation.

12.2 WATERSHED FINDINGS

Information on watershed conditions was obtained by collecting public comments at open houses, working with City staff to identify maintenance and operation problems, conducting a technical stream evaluation of selected reaches, and by modeling the conveyance system for the existing and future build-out scenarios. This information is summarized in Section 12.2.5. A map of the Marys River watershed, presented as Figure 12-1, shows the location of the drainages within the UGB and identifies some of the major observations made during the watershed study.

All three Marys River drainages that were studied have moderate slopes upstream of Brooklane Drive, as shown in Figure 12-2, Photo 1. The central and western drainages become flatter downstream of the culvert. The eastern drainage contains a short, steep section of channel downstream of the culvert before it reaches the flatter floodplain.

The Marys River drainages are currently undergoing significant development. As shown in Figure 12-2, Photos 2 and 3, this development will add considerable impervious area to what has previously been open space and a limited number of homes on large lots. The three culverts examined did not appear to have capacity problems, but the east culvert (Figure 12-2, Photo 4) has a steep slope. The steep slope leads to high velocities, which has caused erosion problems downstream of the culvert in spite of a flow dissipater at the culverts downstream end (Figure 12-2, Photo 5). Problems with erosion have also led to the installation of extensive riprap in the Park Estates development occurring farther to the east at the bottom of the slope (Figure 12-2, Photo 6).

12.2.1 Public Comments

Public meetings were held to encourage and facilitate public input into the planning process. The first of the meetings for the Oak Creek, Marys River, and South Corvallis watersheds was held on June 17, 1999 at the LaSells Stewart Center. During that meeting and a subsequent meeting, on September 30, 1999, residents were encouraged to share their knowledge of problem areas and to identify opportunities for improving the health of the Marys River watershed. A number of general comments related to the Marys River were received at the two meetings and are presented below. Reach-specific comments are presented in Section 12.2.5.

- "Have seen filamentous algae blooms in the Marys River."
- "Does Corvallis monitor for water quality?"
- "Marys River Watershed Council has been monitoring temperature and are trying to find money to monitor contaminants."
- "It isn't a good place to be when we (City) are not monitoring for water quality parameters because it is expensive. We need that information if there are benchmarks for stormwater."
- "Is there documentation of lower Marys River for historical water temperature (100-150 years)? 64 degrees is the target—is that doable?"
- "Another parameter in the Marys River being looked at is flow modification."
- "Seeing pulses of sediment coming down Marys River is disturbing."
- "Since Marys River watershed is pretty much in Benton County, the County could be the jurisdiction to manage the watershed."
- "The City needs to consider how to fund and monitor water quality in the Stormwater Master Plan. If it is a staffing or funding issue, etc., we need to look at this need—a capital program for funds."
- "The City monitors water at one spot on Marys River for limited parameters. We also sample at the downstream end of creeks, but do not check for water quality parameters like pesticides."

12.2.2 City Staff Reports

City Engineering and Utilities Operations staff is familiar with most of the Marys River watershed largely through review of development plans. They provided input into the planning process by identifying known problem areas, recommending areas for stream enhancement activities, and recounting the extent and duration of flooding during major storm events, such as the February 1996 storm.

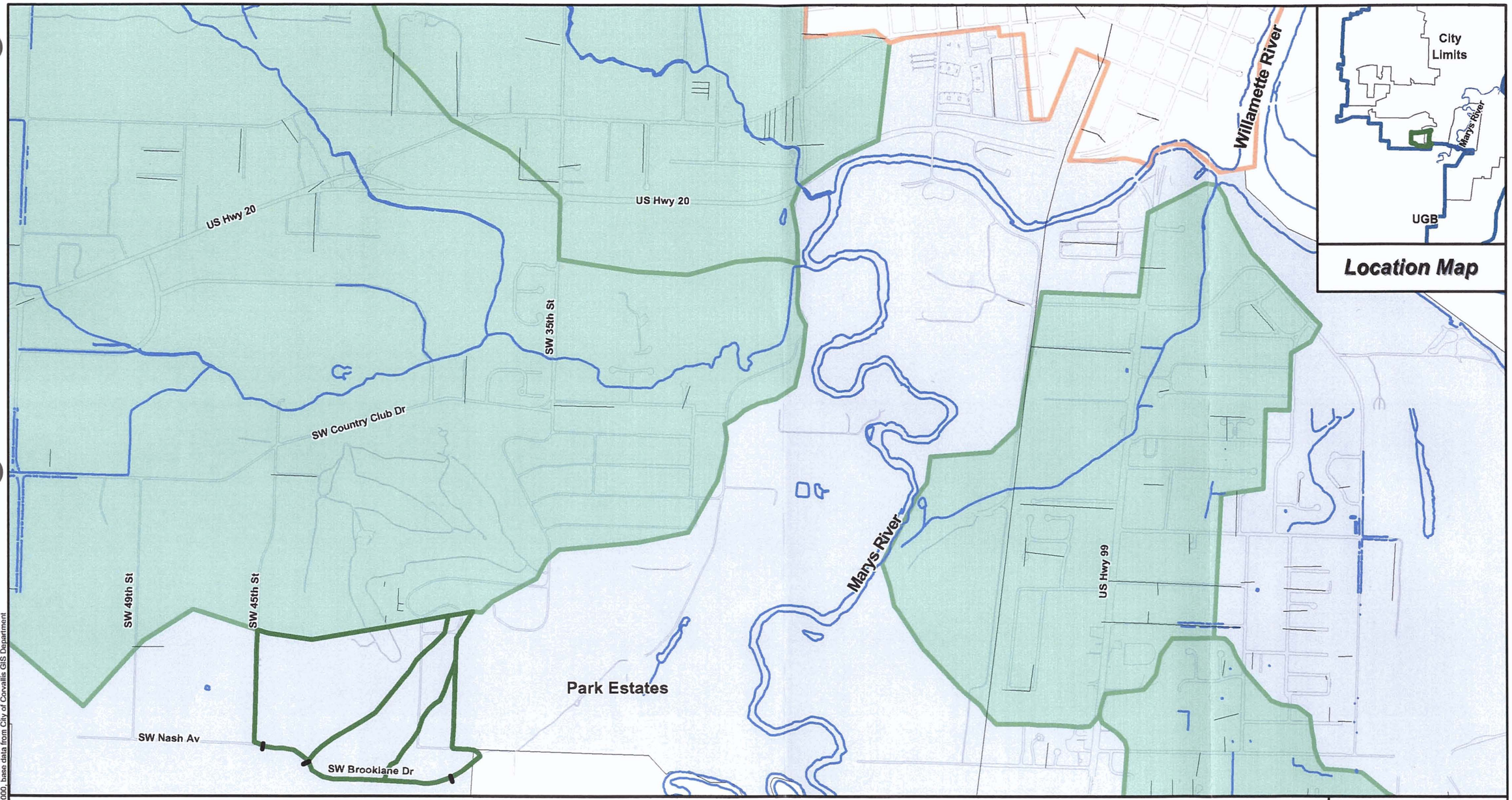

Figure 12-1 Marys River Watershed

LEGEND

- Urban Growth Area
- Combined Basin Area
- Stormwater Basin Area
- Study Basin Boundary
- Culverts

N

Feet 400 0 400 800 1200 1600 Feet

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Figure 12-2. Watershed Photos

Photo 1. Uphill from middle culvert at Brooklane Drive

Photo 2. Marys River area is developing rapidly

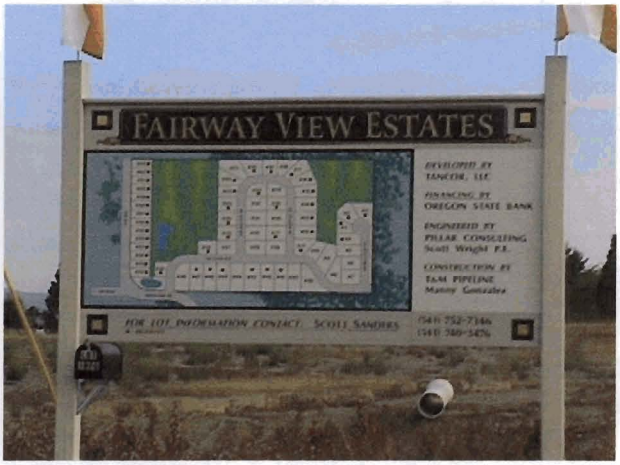

Photo 3. Uphill from east culvert, line of new culvert under Brooklane Drive

Photo 4. Entrance to east culvert in private yard

Photo 5. Erosion at east culvert outlet

Photo 6. Park Estates ditch with riprap

12.2.3 Field Study Observations

No detailed field investigations were conducted for the Marys River watershed. A limited amount of information was collected in August 2000 as part of data gathering for the culvert analysis.

12.2.4 Modeling Results

A computer model for the Marys River watershed identified the hydraulic capacity and projected flows in the culverts of the conveyance system for existing and future build-out scenarios. Existing conditions are based on watershed conditions before the current development, which began during the summer of 2000. Future conditions are based on full development (build-out) of the watershed as identified in the City's Comprehensive Plan. A full range of storms was modeled for the existing and future scenarios, including the 2-, 10-, 25-, and 100-year storm events. None of the three culverts modeled are undersized for the City's 10-year design storm. A complete summary of all modeled segments is provided in Appendix C.

The hydrologic/hydraulic model also estimated flow velocities in channel segments to determine areas at risk for channel or streambank erosion. Velocities in excess of 4 feet per second (fps) may cause erosion of the streambank or streambed. The model predicted velocities based on the 2-year storm event—the storm size most responsible for determining the channel configuration. The velocities below the eastern culvert were estimated as about 5 feet per second, enough to cause the erosion observed in the downstream channel.

Table 12-1. Modeled Velocities for Marys River Basin, Channel Segments Exceeding 4 feet per second

Reach/Model segment	2-year storm		Erosion observed	Existing bank stabilization
	Existing velocities	Future velocities		
Eastern culvert	5.1	5.1	Yes	Yes

12.2.5 Reach Summaries

For study purposes, Marys River was divided into several drainages, each flowing to a single culvert. For consistency with the other chapters of this SWMP, each drainage is referred to as a reach, even though the reaches do not join each other within the study area. The study findings are summarized in the following sections by reach description. Public comments are noted as they were recorded or as provided from various sources, with minimal editing.

West Basin

Public Comments: "What are ideas and plans for the development process to regulate their impacts such as silt during development? Bales that are clearly not doing the job? Example at Country Club and 49th."

"Should developer pay (through development fees or fines) for erosion control program?"

"If put responsibility on owner—outcome-based approach (Senate Bill 1010). Give a land owner the freedom to find a way to achieve an objective, but then have City check-up."

City Staff Reports: No staff reports were available for this reach.

Field Observations: Most of this reach is undergoing development. Future conditions call for housing to fill most of the drainage area, with the exception of some open space left for conservation purposes near the ridgeline. Development will result in substantial increases in impervious areas, flows, and pollutants from this reach. A new 30-inch culvert is being installed under Brooklane Drive to handle flows from the development. Slopes level out by the culvert.

Modeling Results: Modeling showed no capacity problems for the 10-year storm event. Velocities during the 2-year storm event did not exceed the 4 feet-per-second criteria.

Central Basin

Public Comments: No public comments were available for this reach.

City Staff Reports: No staff reports were available for this reach.

Field Observations: The central basin contains single-family homes on large, wooded lots leading down to an agricultural meadow and the culvert under Brooklane Drive. The slope levels out by the culvert. The basin will see some additional development and imperviousness in the future.

Modeling Results: Modeling showed no capacity problems for the 10-year storm event. Velocities during the 2-year storm event did not exceed the 4 feet-per-second criteria.

East Basin

Public Comments: During the field inspection of the culverts, a property owner was concerned about City plans for the area. A week or two previously, she had noticed some people looking around the neighborhood and the next thing she knew there was a crane and other heavy equipment installing new pipe.

City Staff Reports: The intersection of Agate Avenue and Fairmont Drive was closed during the February 1996 storm due to high water.

Field Observations: The main path for stormwater runs through a private yard and enters a culvert under Brooklane Drive. The culvert has a steep grade, resulting in high velocity discharges. A small concrete wall has been incorporated into the culvert apron at its downstream end to dissipate the force of the flow. However, soil is eroding underneath the culvert apron and in the downstream channel.

Modeling Results: Modeling showed no capacity problems for the 10-year storm event. However, the steep culvert discharges high velocity flows, estimated at 5 feet-per-second during the 2-year storm event, causing erosion downstream.

Park Estates Basin

Public Comments: No public comments were available for this reach.

City Staff Reports: City staff reported that the piped system for this development discharges to a pond prior to entering the Marys River.

Field Observations: The Park Estates development is located at the base of the slope below Oak Lawn Memorial Park. A culvert, apparently from the cemetery, discharges to a riprap-lined ditch before entering the pipe system. Most of the development has a moderate to flat slope.

Modeling Results: The Park Estates development was not modeled.

12.3 WATERSHED MANAGEMENT OPTIONS

Recommendations for the Marys River watershed are shown in Table 12-2. Recommended options include extending the steep culvert in the east basin to prevent erosion, conducting effective inspection and enforcement of erosion control plans, and coordinating with the Marys River Watershed Council to improve watershed health throughout the Marys River drainage.

All of the recommendations for the Marys River watershed were assigned to the short-term program listed in Table 12-3. Figure 12-3 shows the general locations of the short-term projects.

Table 12-2. Marys River Options

Reach	Abridged observations	Recommended activity	Timing
West Basin	1) Concern about erosion on construction projects.	a. Develop citywide requirements for erosion and sediment controls.	Ongoing
	2) Increased imperviousness due to development.	a. Preserve vegetated channel system through conservation easements to mitigate effects of increased flows and pollutants.	Short-term
		b. Encourage participation in Watershed Stewardship Education Program (Marys River Watershed Council) by property owners.	Ongoing
Central Basin	1) Increased imperviousness due to development.	a. Preserve vegetated channel system through conservation easements to mitigate effects of increased flows and pollutants.	Short-term
		b. Encourage participation in Watershed Stewardship Education Program (Marys River Watershed Council) by property owners.	Ongoing
East Basin	1) Lack of information about plans for neighborhood.	a. Provide information as part of adoption of stormwater master plan.	Ongoing
	2) Flooding at Agate Avenue and Fairmont Drive.	a. Keep conveyance system clean of debris to prevent flooding due to blockages.	Short-term
		b. Survey and engineering analysis to analyze conveyance system (culvert) in area.	Short-term
	3) High velocity discharges causing erosion downstream of culvert.	a. Extend culvert to flatter area (approximately 100 feet) and install large flow dissipater at this point.	Short-term
Park Estates Basin	1) Increased imperviousness due to development.	a. Preserve vegetated channel system through conservation easements to mitigate effects of increased flows and pollutants.	Short-term
		b. Encourage participation in Watershed Stewardship Education Program (Marys River Watershed Council) by property owners.	Ongoing

Table 12-3. Marys River Short-Term Program

Reach	Recommended activity	Capital cost ($)	Annual O&M ($)	Project type[1]
West Basin	2) Preserve vegetated channel through conservation easements to mitigate effects of development.	2,000	275	
Central Basin	1) Preserve vegetated channel through conservation easements to mitigate effects of development.	2,000	275	
East Basin	2) Clean debris from Agate Avenue and Fairmont Drive.	NA	1,000	
	2) Survey and engineering analysis to analyze conveyance system (culvert) in area.	600	NA	
	3) Extend culvert and install large flow dissipater.	25,000	NA	Green line
Park Estates Basin	1) Preserve vegetated channel through conservation easements to mitigate effects of development.	2,000	275	
Total		**31,600**	**1,825**	

[1]Project types are in the Figure 12-3 map legend.

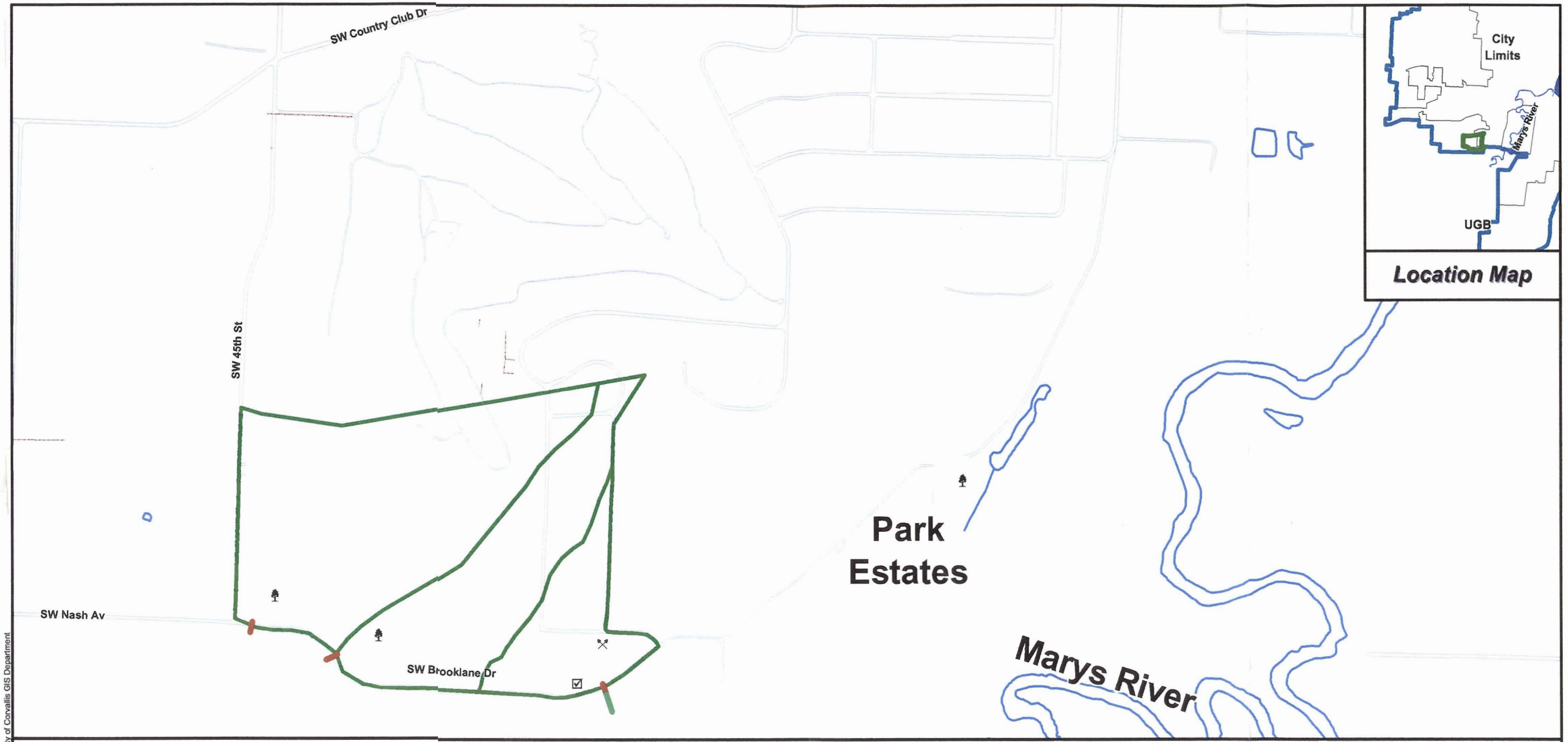

Figure 12-3 Short Term Project Locations

LEGEND

- Pipes/Bridges
- Bank Stabilization
- Replace Pipe/Bridge
- Canopy Revegetation
- Channels
- Basin Boundary
- Channel Improvement
- Fish Passage
- Floodplain Reconnection
- Maintenance
- Flood BMP
- Buffer/Riparian Habitat
- Water Quality BMP
- Monitor
- Multi-Use Facility

N

Feet 400 0 400 800 1200 1600 Feet

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