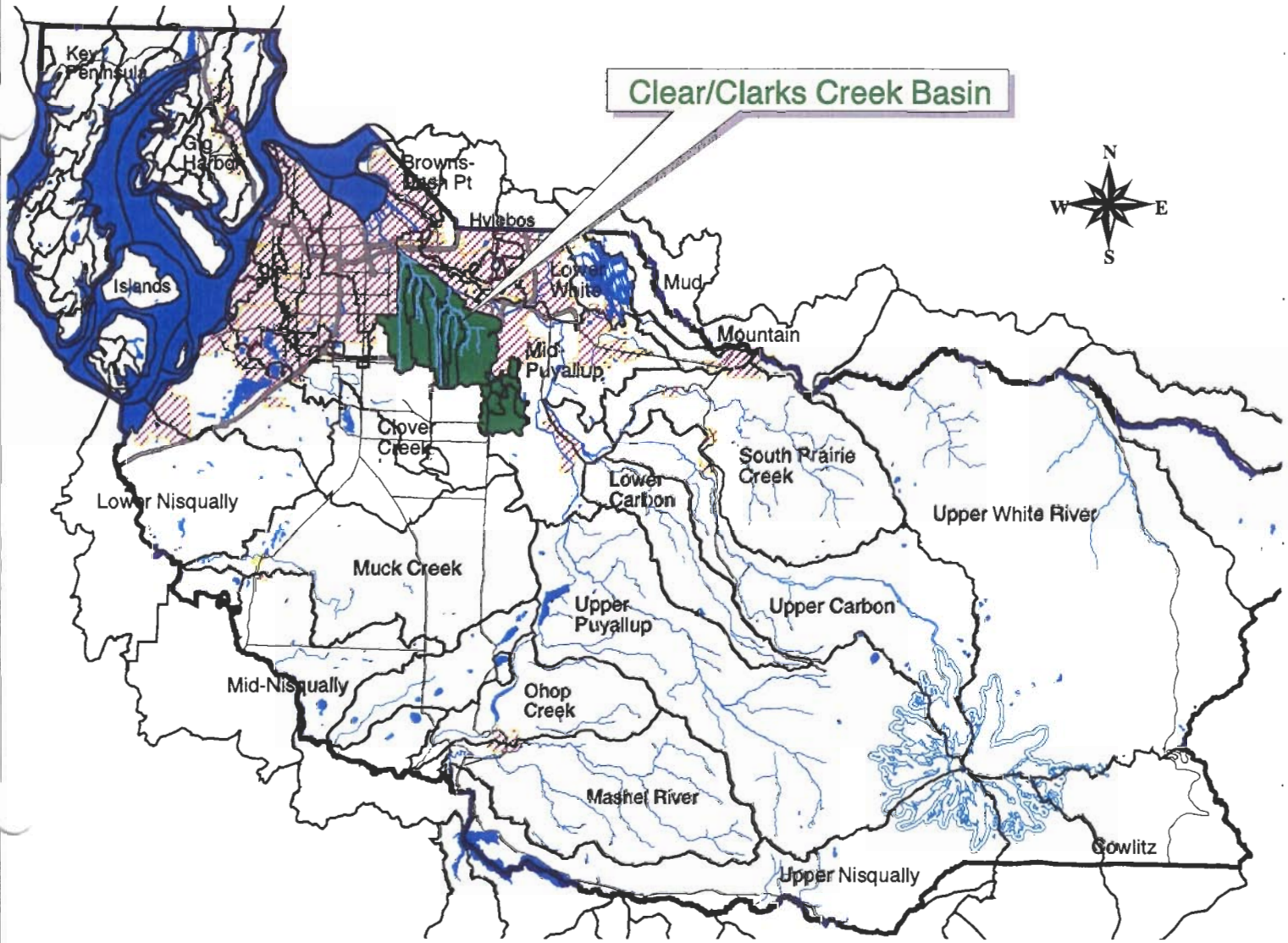
CHAPTER ONE
Introduction

Pierce County Public Works and Utilities - Water Programs Division (Water Programs), is responsible for surface water management in unincorporated Pierce County. In carrying out this responsibility, Water Programs plans, designs, secures permits for, builds and maintains storm drainage and surface water management facilities. Water Programs also identifies non-structural solutions to surface water problems such as monitoring needs, enforcement, regulatory changes, or services. As one agency of Pierce County government, Water Programs advises and works with other agencies, other jurisdictions, and with private interests to ensure that storm drainage and surface water issues are dealt with by appropriate parties as close as possible to the source of the problem. Related responsibilities include compliance with the stormwater quality requirements of the federal Clean Water Act, the County's Stormwater National Pollution Discharge Elimination System (NPDES) Permit, and the habitat protection requirements of the federal Endangered Species Act. Other related responsibilities consist of river levee maintenance, stream gauging, water quality monitoring, gathering of rainfall data, emergency response during floods, water supply planning and public information. Fees paid by property owners in unincorporated Pierce County and grant funds pay for these facilities and services.

1.1 Basin Planning Program

Water Programs is preparing a series of basin plans to identify and prioritize facilities improvements projects and other Water Program activities in individual drainage basins. Basin plans comprehensively tackle flooding, water quality and habitat aspects of surface water management in the major stream systems of the non-federal lands within the County. The basin plans will update the county-wide Pierce County Storm Drainage and Surface Water Management Plan (Montgomery Engineers Inc., 1991)(a.k.a., 1991 Update) by identifying and addressing the flooding, water quality and stream habitat problems in a particular drainage basin in more detail than was possible in 1991. They incorporate the requirements of major federal, State and Pierce County laws, regulations and policies enacted since the 1991 Plan, such as the State Growth Management Act, NPDES requirements of the federal Clean Water Act, and the fish listings under the federal Endangered Species Act (ESA). The basin plans will be implemented primarily through Water Programs activities. However, Water Programs will share information from basin plans to convey issues and needs that might most effectively be dealt with by other agencies and jurisdictions.

Figure 1-1 shows the location of the Clear/Clarks Creek Basin relative to the other 25 drainage basins in the County. The Clover Creek Basin, Mid-Puyallup Basin and Hylebos Basin lie adjacent to the Clear/Clarks Creek Basin. Of these basins, basins plans have been prepared for the Muck Creek Basin, Clover Creek Basin, Gig Harbor Basin and Mid-Puyallup Basin. Other basin plans will follow.



Legend

- Drainage Basin Boundaries
- Clear/Clarks Creek Basin
- Arterials*
  - Limited Access
  - Principle Road
- Streams in Clear/Clarks Creek Basin
- Water Features
- Cities in Pierce County*

Figure 1-1. Clear/Clarks Creek Basin & Vicinity

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Basin plans identify existing conditions that affect storm drainage and surface water, forecast future drainage conditions, identify potential solutions, and evaluate alternatives to the degree that they achieve objectives or create probable significant environmental impacts.

The basin plans concentrate on remedies for frequently flooded areas, water quality problems, fish and wildlife habitat protection, and other surface water management concerns in the unincorporated parts of Pierce County. Drainage facilities within cities and towns, national forests, parks, and military bases are not within the scope of basin plans unless they affect drainage conditions in unincorporated areas.

Basin plans are used to develop capital improvement, maintenance and repair, property acquisition, and program schedules and budgets. The planning process is divided into three phases:

Phase 1 is the basin characterization phase. It consists of inventorying and documenting existing conditions, such as flooding, water quality and habitat problems; existing storm drainage and surface water management facilities; regulatory environment; existing and future land use; stream flow characteristics; stream reaches and associated wetlands; other critical areas; the creek's ability to support various fish species; and the fish species present.

Phase 2 is the plan development and adoption phase. It builds on the findings of Phase 1 by correcting information, performing hydrologic and hydraulic analyses based on planned future conditions, filling information gaps, investigating problems, identifying solutions, and recommending solutions. This document is the culmination of Phase 2.

Phase 3 is the implementation, monitoring and plan update phase.

1.2 Clear/Clarks Creek Basin Plan

The Clear/Clarks Creek Basin Plan is the storm drainage and surface water management plan specific to the Clear/Clarks Creek Basin. It presents the results of the Clear/Clarks Creek Basin planning process. The Basin Plan includes an updated Characterization Report from Phase 1, as chapters one through five. Added are chapters six, seven, and eight, which document the analysis of problems, such as the results of hydrologic and hydraulic modeling used to estimate the amount of stormwater and stormwater volume peaks where flooding or other problems occur. Chapter Nine recommends capital improvement projects and programmatic solutions (non-structural measures, such as recommendations to amend certain regulations) to solve existing and projected future stormwater problems.

1.2.1 Study Area

The Clear/Clarks Creek Basin drains approximately 32.9 square miles (21,038 acres) of north-central Pierce County, of which 27.4 square miles (83 percent) exist within unincorporated Pierce County. The remaining 5.5 square miles (17 percent) lie in the cities of Tacoma and Puyallup.

The Clear/Clarks Creek Basin is part of Washington State Water Resource Inventory Area (WRIA) 10, the Puyallup-White River Basin. The Basin is an amalgamation of four contiguous drainage basins, knit together for cost-efficiency and in consideration of interconnecting drainage improvements. The four basins are as follows:

- **Roosevelt Ditch Drainage Area**, areas draining to Roosevelt Ditch
- **Clear Creek Drainage Basin**, areas draining to Clear Creek
- **Clarks Creek Drainage Basin**, areas draining to Clarks Creek
- **Potholes Drainage Area,** areas draining to the potholes on South Hill

Clear and Clarks Creeks generally flow north before discharging into the Puyallup River at points east of the City of Tacoma. Clear Creek drains the western portion of the Basin. Clarks Creek drains the eastern portion of the Basin, including a portion of the City of Puyallup. The major tributaries to Clear Creek include Swan Creek, Squally Creek, and Canyon Creek. The major tributaries to Clarks Creek include Rody Creek, Meeker Ditch, Diru Creek, and Woodland Creek. The Clear/Clarks Creek Basin also includes the Pothole area, an 8.3-square-mile originally internally drained area on South Hill.

Roosevelt Ditch Drainage

Clear Creek Basin	Swan Creek Squally Creek Clear Creek Canyon Creek
Clarks Creek Basin	Rody Creek Diru Creek Woodland Creek Clarks Creek
Potholes	• Afdem • Black Swamp • Capital • Heritage Glen • 128th Street • Meridian Street • 135th Street • 117th Street • Candlewood-Manorwood • Tip Top • Lower 144th Street • Alderwood • Upper 144th Street • Springfield • South Central • 110th Avenue

1.2.2 Description of Subbasins

Subbasins are the planning units of the basin plans. They are derived by dividing the stream basin into subbasins, then further dividing the subbasins into smaller and more manageable subbasins, generally on the basis of stream reaches. The division is one of the first steps in the basin planning process. Although for this study the "Basin" is referred to as the Clear/Clarks Creek Basin, for planning purposes it includes the two creek drainage basins, the potholes area of South Hill, and the Roosevelt Ditch drainage area. These drainages constitute the major subbasins of the planning area.

First, each basin in the Clear/Clarks Creek Basin was divided into subbasins:

- Clear Creek Basin was divided into four subbasins: Swan Creek, Squally Creek, Clear Creek, and Canyon Creek.
- Clarks Creek Basin was divided into four subbasins: Rody Creek (sometimes referred to as "unnamed tributary to Clarks Creek"), Diru Creek, Woodland Creek, and Clarks Creek.
- Pothole Basin was divided into 16 named subbasins; each one a separate "pothole" area.
- Next, each of the eight stream subbasins of Clear Creek and Clarks Creeks were divided into 31 smaller, more manageable, planning units based on stream reaches as described in Section 4.7, Aquatic and Riparian Habitat.

Some of the Pothole subbasin boundaries and names were based on information from the South Hill Drainage Improvements Report (Pierce County, 2001). The overall Clear/Clarks Creek Basin boundary (including the Pothole areas) delineation came from Pierce County and was not modified as part of this study.

1.2.3 Key Elements of the Basin Plan

Key elements addressed in the Clear/Clarks Creek Basin Plan are:

Existing Conditions

- Characterization of topography, soils, current and future flow volumes, water quality, habitat and land cover factors influencing surface water runoff

Problems

- Flooding due to surface water and/or groundwater
- Surface water quality impairment related to stormwater runoff
- Stream and riparian habitat degradation due to stormwater

Impacts

- Loss of beneficial uses (recreation, water supply, habitat, and drinking water, etc.)
- Negative effects of stormwater runoff on the ability to meet federal, State and local regulations
- Property damage from flooding, inadequate drainage or high groundwater
- Threats to public health and safety (road inundation, impaired surface water quality and drinking water quality, etc.)

Solutions

- Capital projects (e.g., flood control facilities, creek and watershed restoration, etc., related to storm drainage)
- Direct or indirect control of land use impacts (e.g., zoning, buffers, and stormwater facility design standards, etc.)
- Basin-specific development standards (e.g., discharge rates and volume control)
- Storm drainage system maintenance activities
- Additional research or on-going monitoring
- Others as appropriate

1.3 Statement of Purpose

The purpose of the Clear/Clarks Creek Basin Plan is to establish the actions Pierce County will take and what is needed to reduce flood hazards and other storm drainage problems, protect water quality, and to protect fish and wildlife habitat in the Clear/Clarks Creek drainage basin. Recommended actions reflect the physical characteristics of the Basin; the laws, policies and regulations that apply to surface water management in Pierce County; the preferences of citizens in the County and in the Clear/Clarks Creek Basin; and the character of existing land use and planned growth as set out in the Comprehensive Plan for Pierce County, Washington.

1.4 Goals and Objectives

Water Programs drew up general goals and objectives for basin plans as presented in *Table 1-1* to promote consistency between basin plans. The goals and objectives form the base evaluation criteria for selection of recommended facilities, policies, and surface water management program modifications from among the various alternatives. They also permit the facilities recommended by basin plans to be compared and ranked with one another.

TABLE 1-1
Goals of the Clear/Clarks Creek Basin Plan

Goal	Objectives
Reduce flood hazards	Incidents of property loss and repeat damage are reduced. Streams will not be adversely impacted by flood events. Pierce County standing under the Federal Emergency Management Agency Community Rating System is improved. New development is located outside of flood-prone area.
Improve fish & wildlife habitat	Number of stream miles available for wild, native fish populations is increased. Population numbers of species listed as endangered or threatened under the Federal Endangered Species Act (ESA) are maintained or increased. Quality and quantity of available wetland, riparian, and upland habitat is improved.
Improve water quality	State Surface Water Quality Standards (WAC 173-201a) are met or exceeded. Number of impaired (303d listed) waterbodies is reduced. Pierce County is in compliance with its NPDES permit for stormwater by meeting permit terms and conditions to the maximum extent practicable. Risk of groundwater contamination is reduced. Rates of erosion are reduced.
Demonstrate coordinated & responsible use of public resources	Cost of maintaining stormwater facilities is reduced. Project value is favorable when measured against costs and benefits. Polls demonstrate that public awareness of flooding, habitat, and water quality issues has increased. Monitoring and enforcement programs demonstrate an increase in services per dollar spent. Basin plan implementation also implements elements of other Pierce County plans. Other agencies and jurisdictions use basin plan findings in planning their activities.
Influence location & methods for new development	New development in flood-prone, riparian, or significant habitat areas is prohibited. Low Impact Development techniques are widely used. Effective BMPs are identified and widely used.

Sources: Guidance for Basin Planning, Pierce County Water Programs, June 2000., Pierce County Public Works & Utilities, Water Programs; Pierce County Storm Drainage and Surface Water Management Advisory Board, June 2005