Introduction

PURPOSE

The Fanno and Tryon Creeks Watershed Plan (Watershed Plan) characterizes watershed conditions, identifies watershed problems and assets, and recommends a comprehensive and strategic set of projects, programs, and activities to improve watershed health.

The Bureau of Environmental Services (BES) has developed the Watershed Plan in collaboration with other city bureaus. Recommendations are consistent with other efforts to improve the health of Portland's watersheds, including the City's River Renaissance Initiative and Endangered Species Act (ESA) Program. The Watershed Plan also helps the City comply with federal regulations, including the ESA and the Clean Water Act.

WATERSHED PLANNING BASIS: KEY DRIVERS

A successful watershed planning process must address related programs and processes. From the beginning, the Fanno/Tryon watershed planning process responded to the following key drivers:

- River Renaissance
- Endangered Species Act
- Citizen Input, Public Outreach, and Community Needs
- Clean River Plan
- Land Use Planning/Community Plans
- Public Facilities Plan—Stormwater and Sanitary Systems
- Natural Resource Assessments
- Water Quality—TMDLs and NPDES Regulations

River Renaissance

River Renaissance is a comprehensive vision that encompasses the entire city of Portland. The River Renaissance Initiative seeks to realize the vision through a partnership of residents, businesses, industry, not-for-profit organizations, and public agencies. Areas of focus include planning (e.g., developing the River Renaissance Plan and continuing work that advances River Renaissance); showcasing early actions; solidifying partnerships; engaging the public; and developing a sustainable funding strategy to implement River Renaissance projects.

BES is a part of the River Renaissance effort, along with other City bureaus, residents, businesses, community groups, property owners, and government agencies. BES's watershed plans constitute the major components of the River Renaissance's 'clean and healthy river' theme.

Endangered Species Act (ESA)

The City's ESA Program finalized the *Framework for Integrated Management of Watershed and River Health* (Framework) in 2003. The initial structure of the Framework was developed in 2001. The framework guides the development of all the City's watershed plans. The ESA

program also developed an inventory of culverts and pipes in the watersheds for fish passage implications. In addition, the ESA program used existing information to analyze the watersheds in order to develop components of a fish recovery plan. The Watershed Plan uses the methodology and other information developed by the ESA Program.

BES is the lead City bureau for developing information and implementing strategies to address stormwater quality and quantity, management, and conveyance. BES's stormwater activities are directly tied to the City's recovery efforts for species listed under the ESA.

Citizen Input, Public Outreach, and Community Needs

To be successful and capable of implementation, the Watershed Plan must reflect community and public expectations, input, and feedback. Portland's southwest community has consistently raised and promoted issues that affect, maintain, and/or promote watershed and stream health and water quality. The Watershed Plan process provided numerous opportunities for public involvement and feedback through a well-designed public outreach component. Involved groups included the Tryon Creek Watershed Council, Fans of Fanno, neighborhood associations, and others. Public involvement will continue as specific projects and programs are implemented.

Key issues identified by the community include the need to:

- Link land use planning and development to watershed health.
- Address onsite stormwater management through the land use process.
- Address infrastructure capacity and the need for regional detention facilities to accommodate existing and future land use
- Identify links between zoning and imperviousness
- Develop new development standards in southwest Portland
- Provide interagency coordination
- Address public concerns throughout the planning process

BES is the lead City bureau for developing highly technical, scientific, and objective information used in various City programs and activities that protect and improve water quality and watershed health and provide adequate conveyance facilities for stormwater and sanitary sewage. BES has the lead for providing public involvement opportunities as part of the watershed planning process.

Clean River Plan

The Clean River Plan is the City's conceptual umbrella and guidance for achieving multiple water quality, watershed and stream health, habitat, and other resource objectives in a carefully planned sequence during the next 20 years. Development of the Clean Water Plan involved a three-year Integrated Watershed Planning process (BES 2000), review of the Combined Sewer Overflow (CSO) Program, and review of all the City's sewer and drainage facilities. The Clean River Plan identifies ten actions that provide a holistic approach to solving water quality problems and meeting the overall goals of healthy streams and rivers. Eight of these ten actions are relevant to the Watershed Plan:

Action 1: Plant trees, native vegetation, and create buffers along streams.

Action 3: Reduce stormwater flow and pollutants reaching streams.
Action 5: Control erosion from construction and development.
Action 6: Increase pollution prevention and source control.
Action 7: Education and stewardship.
Action 8: Floodplain restoration.
Action 9: Watershed assessment and monitoring.
Action 10: Coordination and partnerships.

BES has the lead role in implementing the Clean River Plan. The Watershed Plan's recommendations are consistent with the principles of the Clean River Plan.

Land Use Planning/Community Plans

Portland's *Comprehensive Land Use Plan* is the City's most comprehensive tool for guiding land use planning and resource protection. The *Southwest Community Plan* designates base zones and overlay zones in southwest Portland. The Planning Bureau is the lead bureau for administering the *Comprehensive Plan*, *Southwest Community Plan*, and related city code.

In addition to the base zone designation, the stream corridors and most open areas in southwest Portland also have the environmental protection and/or environmental conservation overlay zone designation. These overlays are designed to protect streams and other significant resource areas.

Key issues related to the Southwest Community Plan and land use planning coordination in southwest Portland include the need to:

- Link land use planning and development to watershed health.
- Provide adequate sanitary and storm infrastructure to accommodate existing and future land uses while improving watershed health.
- Link zoning and impervious surface area.
- Create new development standards.

BES is not responsible for land use planning. As an infrastructure bureau, however, BES provides technical support to the Planning Bureau in the land use process. BES's role is critical for providing adequate sanitary and stormwater services—including detention and onsite management—to accommodate proposed changes in the Southwest Community Plan area. Its role is also critical for ensuring protection of watershed health and maintaining a well functioning infrastructure.

Public Facilities Plan – Stormwater and Sanitary Systems

BES completed an update of its *Public Facilities Plan* (PFP) in 1999. This update included an extensive evaluation of the City's stormwater and sanitary systems/infrastructure. The *Fanno Creek Resources Management Plan* (Brown & Caldwell 1998) and the *Upper Tryon Creek Corridor Assessment* (Brown & Caldwell 1997) were also completed as part of the PFP. The PFP includes extensive information about the capacity, operation, and upgrade needs of the infrastructure and stream corridors. However, the PFP and the Fanno and Tryon Creek reports lack details about upland areas, water quality, surface/groundwater interflow, fisheries/habitat impact, cause/effect analysis, and stormwater characterization.

The Watershed Plan seeks to complement and extend these efforts by addressing the need to:

- Link land use planning and development to infrastructure capacity.
- Conduct hydrologic/hydraulic analysis.
- Integrate the ESA Program's analysis of how the stormwater and sanitary infrastructure affects water quality, habitat, and fish passage.
- Provide adequate sanitary and storm infrastructure to accommodate existing and future land uses while improving watershed health.
- Describe the physical impact of storm and sanitary infrastructure on stream conditions and watershed health.

Natural Resource Assessments

BES completed a stream corridor assessment of Fanno and Tryon Creeks and their major tributaries in 1996, as part of the *Fanno Creek Resource Management Plan* and *Upper Tryon Creek Corridor Assessment*. The Oregon Department of Fish and Wildlife and the City of Portland completed a stream assessment/survey of Tryon and Fanno Creeks and some of their tributaries in 1999-2001. That assessment focused on the streams and immediate riparian areas. Stream assessments have not been completed for Ash Creek, Cedar Mill Creek, and smaller tributary creeks.

Metro recently conducted wildlife habitat assessments throughout the region. The City's Bureau of Planning conducted general habitat inventories as part of the *Fanno Creek and Tributaries Conservation Plan* (1993) and *Southwest Hills Resources Protection Plan* (1992). There is no overall assessment of watershed functions and resources in terms of response to management activities and land uses in the watershed.

Many of these assessments and plans have made several recommendations for enhancing and restoring streams and the immediate riparian areas. BES has pursued and implemented some of these recommendations in the form of stream restoration and revegetation projects.

Key issues the Watershed Plan must address include the need for:

- A comprehensive assessment of upland areas and an analysis of causes and effects regarding watershed and stream functions, water quality, and habitat value and connectivity.
- Characterization of stormwater, water quality, and the interaction between stormwater routing, infiltration, and stream recharge in the watershed.
- Delineation of the historical stream patterns to determine the level of stream loss, better predict watershed functions, and determine restoration needs.
- A comprehensive soils and slope analysis, and characterization of the potential for stormwater routing and onsite management.

BES has a key interest in completing these tasks because it is a service provider bureau with an extensive network of stormwater and sanitary systems and is responsible for addressing key water quality, quantity, and other environmental and natural resource issues and regulations.

Water Quality – TMDLs and NPDES Regulations

Fanno Creek and its tributaries are subject to the regulations related to the Tualatin Basin total maximum daily loads (TMDLs) for phosphorus, bacteria, dissolved oxygen, and summer temperature. Tryon Creek is on the state of Oregon's 303(d) list for exceeding the water quality standard for summer temperature. Both watersheds are subject to the requirements of the City's municipal stormwater permit under the National Pollutant Discharge Elimination System (NPDES).

Extensive water quality data exist for Fanno Creek and its tributaries. These data have been analyzed to determine trends and to refine the monitoring program in 1996 and 2000. Water quality data have been available from one location on Tryon Creek since 1997. A limited analysis of these data was performed in 2000.

Actual stormwater water quality data in the watersheds are limited. Land use-based stormwater models show that two major stormwater outfalls in the Tryon Creek Watershed are major contributors of pollutants, especially total suspended solids (TSS).

Key water quality issues the Watershed Plan needs to address include:

- Development of water quality improvement strategies specific to TMDL requirements for Fanno Creek (phosphorus, bacteria, dissolved oxygen, and temperature), 303(d) requirements for Tryon Creek (a temperature management plan), and NPDES stormwater parameter requirements. This would include determining timelines for implementation and specific achievement goals.
- Delineation, identification, characterization, and ranking of the hydrologic model units in terms of pollutant loading for TMDL, 303(d), and NPDES stormwater parameters

BES has a key interest in completing these tasks because it is a service provider bureau with an extensive network of stormwater and sanitary system, and is responsible for ensuring the City's compliance with all water quality regulations.

WATERSHED PLANNING PROCESS

The *Framework for Integrated Management of Watershed Health* outlines scientific principles, four watershed health goals, and a process for developing and implementing watershed management plans. The Watershed Plan was developed in accordance with these principles, goals, and process.

Figure 1 summarizes the four-phase, ten-step process. The steps represent a sequential assessment and decision-making approach to set watershed goals and objectives, characterize conditions, develop management solutions, and implement actions and assess their success. The circular nature of the process suggests that watershed management involves ongoing adaptive management and important feedback to ensure that watershed goals and objectives are achieved.

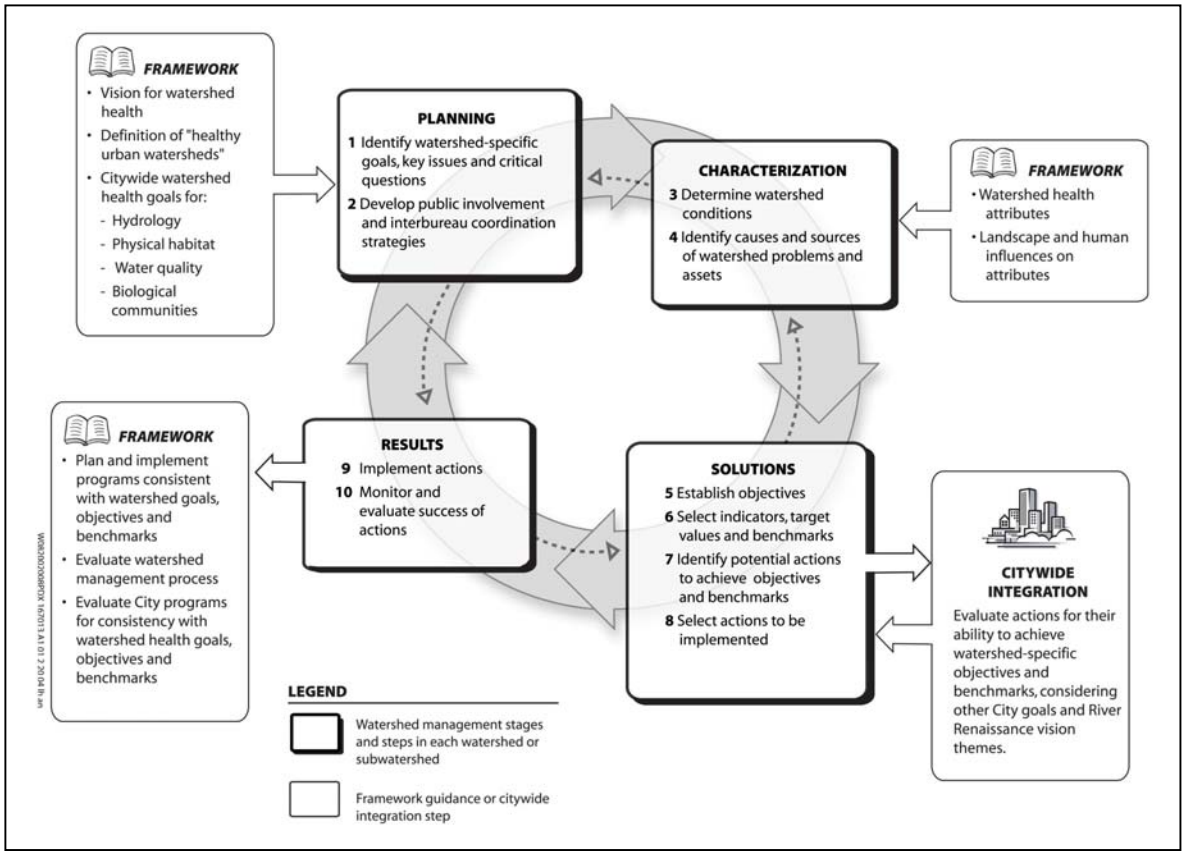

Figure 1
Watershed Management Process.

Phase 1: Planning—Step 1

The first step in the watershed planning process is to develop a Watershed Plan **scope** and **workplan** and identify **watershed-specific goals**, **key issues**, and **critical questions**.

Watershed Plan: Scope and Workplan

The scope and workplan for the Watershed Plan was completed in fall 2001 (see Appendix X). In accordance with the Framework, the workplan provides detailed steps and tasks for conducting the watershed characterization and developing the Watershed Plan.

Preliminary Watershed Plan Goals and Objectives

The Framework outlines four goals for watershed health:

- **Stream Flow and Hydrology**: Move toward historical flow conditions to protect and improve watershed and stream health, channel function, and public health and safety, while protecting infrastructure.
- **Physical Habitat**: Protect, enhance, and restore where possible aquatic and terrestrial habitat conditions, including sediment, to support key ecological functions and improved

productivity, diversity, capacity, and distribution of native fish and wildlife populations and biological communities.

- **Water Quality**: Protect and improve surface water and groundwater quality, and meet or surpass state and federal water quality standards and regulations.
- **Biological Communities**: Protect, enhance, and restore where possible target aquatic and terrestrial species and biological communities to maintain biodiversity in Portland's watersheds.

In addition to the four watershed health goals, the City of Portland has two additional watershed planning goals:

- **Public Participation**: Incorporate public values into watershed plan development, implementation, and refinement, and support long-term community-wide commitment to improve and sustain watershed health.

- **Public Health and Safety**: Protect property and public health by planning, designing, building, operating. and maintaining sanitary sewer and stormwater infrastructure.

These goals guided the overall development of the Watershed Plan. However, the goals needed to be tailored to each of the City's watersheds. The Fanno/Tryon Project Goals and Objectives listed below were established to provide an overall framework for developing the project workplan and to provide guidance for describing the critical watershed issues and key questions. Revised goals, objectives, targets, indicators, and benchmarks were established later in the planning process based on the characterizations. (See Part 5 of this document.)

Fanno/Tryon Creek Project Preliminary Goals and Objectives

GOAL I: WATER QUANTITY – PROTECT AND IMPROVE STREAMFLOWS FOR PUBLIC HEALTH AND SAFETY AND WATERSHED HEALTH.

Objectives:

- Characterize the watershed elements affecting streamflows and stormwater collection and conveyance.

- Provide infrastructure to support implementation of the Southwest Community Plan.

- Establish interrelationships between flows and stream stability, water quality, fish and wildlife habitat, infrastructure capacity, and property protection.

- Develop flow management and instream strategies to protect and improve the established interrelationships, including but not limited to:

    1. Reduction in the volume, velocities, and peak flow concentration time of storm runoff.

2. Identification of areas and facility sites to help lessen the impact of stormwater runoff on infrastructure capacity and stream system functions.

3. Development of a proactive maintenance plan for the storm sewer system to provide for proper functioning and adequate capacity.

4. Identification, protection, and restoration/stabilization of stream channels.

5. Identification and prioritization of all public and private stormwater outfalls into the stream and initiation of a program to retrofit these outfalls for water quality and discharge benefits.

6. Identification of strategies to protect areas critical for groundwater recharge and provision of base flows in the stream channels.

7. Identification of strategies to minimize stormwater runoff damage to existing public and private structures.

GOAL II: WATER QUALITY – PROTECT AND IMPROVE SURFACE WATER QUALITY AND MEET STATE AND FEDERAL WATER QUALITY STANDARDS.

Objectives:

- Characterize the Watershed Plan area for pollutant loading and develop a water quality management plan to meet the TMDLs for phosphorus, temperature, dissolved oxygen, and bacteria in the Fanno Creek Watershed.

- Develop a temperature management plan for Tryon Creek to meet the water quality standard for temperature.

- Develop a watershed-specific strategy to implement the City's Stormwater Program requirements in the Fanno and Tryon Creek Watersheds.

- Identify and prioritize additional water quality issues of concern in the Fanno and Tryon Creek Watersheds and develop strategies for addressing these issues.

GOAL III: HABITAT – SUPPORT KEY ECOLOGICAL FUNCTIONS, TARGET SPECIES, AND BIOLOGICAL COMMUNITIES BY PROTECTING, ENHANCING, AND RESTORING AQUATIC AND TERRESTRIAL HABITAT CONDITIONS.

Objectives:

- Develop a prioritized, scientifically supported strategy for protection, enhancement, and restoration of habitat conditions for the watershed. Strategy development will involve the following steps:

    1. Inventory physical characteristics affecting key biological communities, target species, and ecological functions in the watershed, taking into account the role of the watershed in the regional habitat "landscape."

2. Characterize current habitat conditions in the context of biological communities, target species, and ecological functions in the watershed.

3. Evaluate current and potential future habitat condition relative to identified standards, thresholds, and benchmarks for identified habitat attributes and indicators. Identify limiting factors for biological communities and target species relative to water quantity, habitat structure and productivity (e.g., food, nutrients), water quality, and other key watershed elements.

4. Identify and evaluate actions and strategies to protect, enhance, and restore habitat conditions, taking into consideration potential interactions and interspecies impacts.

GOAL IV: – BIOLOGICAL COMMUNITIES – PROTECT AND RESTORE TARGET AQUATIC AND TERRESTRIAL SPECIES AND BIOLOGICAL COMMUNITIES TO MAINTAIN BIODIVERSITY IN THE WATERSHED, AND TO MEET APPLICABLE POLICIES AND REGULATORY REQUIREMENTS.

Objectives:

- Develop a method for identifying and prioritizing biological communities and target species to be addressed in the Watershed Plans. Steps will include:

  1. Establish an historical context for biological communities, species, ecological functions, and habitats for the watershed.

  2. Characterize current ecological functions, biological communities, species, and habitats in the watershed, and compare them to the historical context.

  3. Identify focal biological communities and species for purposes of watershed characterization, condition assessment, and strategy development/evaluation. Target communities and species will include but not necessarily be limited to: 1) species currently listed, or proposed to be listed, as sensitive, threatened, or endangered under state or federal law; 2) species that have a direct impact on listed or candidate species; 3) species that perform key ecological functions and contribute to the “shaping” of the watershed (e.g., food sources, nutrient cycling, seed dispersal, predator/prey balancing); and 4) species or populations that are considered by qualified experts to be important in terms of their location in their range and/or other distinguishing factors.

  4. Determine which biological communities and species will be targeted for protection, enhancement, and restoration in the Watershed Plan, taking into consideration compatibility with the urban setting. (Note: Different communities and species may be targeted in different parts of the watershed.)

- Ensure that the Watershed Plan recommendations will contribute toward sustaining healthy biological communities and target species, improving conditions for species at risk, and preventing future state and federal listing.

GOAL V: PUBLIC HEALTH AND SAFETY/INFRASTRUCTURE - ENSURE CONSISTENCY AND COMPATIBILITY BETWEEN CITY WATERSHED PLANS AND THE CITY'S INFRASTRUCTURE PROGRAMS TO PROTECT PUBLIC HEALTH AND SAFETY.

Objectives:

- Characterize current and projected flows and pollutant loads entering the sewer system and discharging from the sewer system to receiving waters.

- Inventory/map the existing and proposed sewer, stormwater, water, and roads infrastructure as an "urban indicator" as part of the watershed assessment process.

- Analyze the physical setting of existing and planned infrastructure to identify current or potential impairments to key watershed functions, conflicts with watershed goals and objectives, and known or anticipated public health or safety risks.

- Develop strategies to prevent and eliminate health and watershed impacts from subsurface/onsite sewage discharges in unsewered areas.

- Establish points of interaction and a clear coordination process to ensure that Watershed Plan information and recommendations are provided in a timely manner and used consistently and effectively to inform City capital and public facilities planning and implementation activities. These activities include: 1) update of City capital infrastructure programs (CIPs) and public facilities plans (PFPs); 2) development of CIP project requests; 3) CIP projects underway; and 4) bureau maintenance priorities and practices.

GOAL VI: PUBLIC INVOLVEMENT – INCORPORATE PUBLIC VALUES INTO WATERSHED PLAN DEVELOPMENT, IMPLEMENTATION, AND REFINEMENT.

Objectives:

- Provide and facilitate coordination and decision-making.

- Provide timely project information to the public.

- Provide opportunities for public input into the project.

- Present the final Fanno and Tryon Creek Watershed Plan and findings to the public.

- Provide and maintain connection to the River Renaissance process.

GOAL VII: STEWARDSHIP – MAINTAIN LONG-TERM COMMUNITY-WIDE COMMITMENT TO IMPROVE AND SUSTAIN WATERSHED HEALTH.

Objectives:

- Establish a strategy for promoting and carrying out community stewardship projects and programs in the watershed. The strategy will identify City services to be provided, establish

targeted opportunities for stewardship activities, and identify partnerships and funding opportunities for implementation of community- and City-initiated projects.

- Develop a strategy to inform the public about watershed goals/objectives.
- Create partnerships with agencies, residents, and businesses.
- Establish an evaluation method for stewardship program effectiveness.

GOAL VIII: MONITORING AND EVALUATION - ASSESS WATERSHED CONDITIONS AND TRENDS OVER TIME TO ENSURE WATERSHED PLAN GOALS AND OBJECTIVES ARE MET.

Objectives:

- Develop and implement an integrated monitoring strategy for the watershed.
- Develop an adaptive management approach.
- Assign roles and responsibilities for monitoring, analysis, and compliance reporting.

GOAL IX: COORDINATION AND CONSISTENCY WITH PLANS AND POLICIES – MEET WATERSHED GOALS AND OBJECTIVES AND ACHIEVE CONSISTENCY WITH APPLICABLE PLANS AND POLICIES, THROUGH ACTIVE COORDINATION AND PARTICIPATION WITH OTHER AGENCIES AND ORGANIZATIONS.

Objectives:

- Ensure that the watershed planning process is coordinated with, and takes into consideration, applicable plans and policies. Steps include, but are not limited to:

  1. Identify key plans and policies in the watershed planning area as part of the watershed assessment and characterization process (e.g., River Renaissance, land use plans, urban renewal and redevelopment plans, transportation plans, and parks and recreation plans).
  2. Identify and address potential conflicts and opportunities between the Fanno and Tryon Creek Watershed Plan alternatives and other plans and policies.
  3. Establish points of interaction and a clear coordination process to ensure that Watershed Plan information and recommendations are provided in a timely manner and used consistently and effectively to inform development and updates of key City plans and policies.

  - Establish prioritized strategies and actions for coordination with agencies and organizations within and external to the watershed to ensure that projects, programs, and plans are compatible and that watershed plan goals and objectives are met.

Critical Questions

Critical questions outline the issues the Watershed Plan should address. Their development was based partly on the drivers discussed on pages 1-1 – 1-5, in collaboration with the Tryon/Fanno

Advisory Committee, and on the goals and objectives above. Critical questions were developed for water quantity, water quality, habitat, biological communities, monitoring, coordination and consistency with other plans and policies, and stewardship. Appendix X contains the critical questions.

Phase 1: Planning—Step 2

The second step in the watershed planning process is to develop **public involvement and interbureau coordination strategies.**

The Fanno and Tryon Creek watershed planning effort has maintained a strong public involvement component to keep citizens informed and involved and to fulfill the directives of the planning process. Citizen involvement is also required or suggested as a strategy in various local, state, and federal policies. For example, it is incorporated in the Oregon's statewide planning goals, Portland's *Comprehensive Plan*, and the Portland city code.

The variety of strategies used to involve and inform the public can be divided into the following four categories:

1. **Public Involvement in Specific Projects**. Public involvement activities are tailored to the particular circumstances and needs of each program or project. These activities include providing public information about key project issues, providing opportunities for the public to provide input on project elements and decisions, and enhancing existing and creating new long-term partnerships with neighborhood, business, environmental, and citizen interest groups.

2. **Information and Education**. . Information and education focuses on the critical questions asked in the Watershed Plan that are of interest to landowners and/or residents affected by recommended early actions and projects. Specific tools include websites, project information, fact sheets and brochures, special events, newsletters, community bulletin boards, presentations, and educational workshops.

3. **Environmental Stewardship**. Stewardship is essential to the long-term success of the Watershed Plan. Stewardship methods include supporting existing stewardship groups and cultivating new groups; identifying opportunities for businesses to become stewards; offering stewardship grants through BES's Community Watershed Stewardship Grant Program; offering incentives, technical assistance, and cost share programs; and offering resources for stewardship groups. Other tools to implement the Watershed Plan could include partnerships with other bureaus and agencies to provide additional resources for individuals and groups.

4. **Tryon/Fanno Advisory Committee**. The Tryon/Fanno Advisory Committee includes members of the community and representatives from other City bureaus. The Advisory Committee has been involved throughout the development of the Watershed Plan. Members provide critical information and review Watershed Plan documents and other products.

Phase 2: Characterization

The critical questions, developed in Phase 1, define the scope of the characterization. The characterization describes current conditions and identifies problems and opportunities for the four watershed health goals (Part 2) and three additional watershed elements important to watershed health (Part 3).

Problems, opportunities/assets, and sources are identified throughout Parts 2 and 3 and are summarized by subwatershed in Part 4.

Phase 3: Solutions (To be completed)

Using criteria, problems and opportunities/assets were divided into two broad Tiers. Tier 1 problems and opportunities/assets are directly linked to ESA listed species or critical limiting factors that impair ecological functions and watershed health. Objectives, for each watershed health goal, were developed to address Tier 1 problems. Objectives, indicators, targets, and benchmarks were established for all objectives. (See Part 5.)

Alternative project and programs to improve watershed health are recommended to address Tier 1 problems and opportunities/assets and achieve watershed goals and objectives. Recommended projects include restoration of streams and riparian areas, replacement of culverts that impede fish passage, and water quality facilities to intercept and filter stormwater runoff from high-traffic streets and parking lots. Recommended programs include suggested land use policies to preserve existing tree canopy cover, design standards to reduce effective impervious area, and changes to maintenance practices such as increased street sweeping to remove pollutants before entering area streams.

Phase 4: Results

To be completed.

REFERENCES

Note: Some documents listed below may include a direct web link to the document. All other references are available upon request. To request a document, please email shannona@bes.ci.portland.or.us

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