2005 PORTLAND WATERSHED MANAGEMENT PLAN

Annual Report

2005

RIVER
RENAISSANCE

ENVIRONMENTAL SERVICES
CITY OF PORTLAND

working for clean rivers

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INTRODUCTION

Watershed Plan Context

The City of Portland's watershed approach is designed to improve Portland watershed health through actions that address multiple problems at once. Rather than focusing separately on single issues such as flooding, combined sewer overflows (CSOs), or contaminated sediments, this holistic watershed approach considers all of the activities in the urban landscape that affect watershed conditions.

The watershed approach relies on integrating the activities of multiple city bureaus, and maximizes the use of limited resources by looking for solutions that meet multiple objectives. The approach includes management tools to measure results and track progress with a focus on addressing environmental problems at their source and improving watershed health overall, not merely complying with individual regulations. The City's watershed approach will incorporate City values such as public safety, economic vitality and community stewardship into decision making and, over time, will inform the activities of every City bureau and program that has an effect on watershed health.

As a municipal government, Portland has the utility service and regulatory responsibility for managing stormwater, which plays a large part in defining the health of our watersheds. The Portland Watershed Management Plan establishes a citywide system to guide a wide range of decisions. This plan sets a policy course that expresses Portland's commitment to improve watershed health and protect and enhance its natural resources.

The City of Portland is continuously implementing programs and projects to achieve watershed health objectives while continuing to grow and develop. In order to do this work, City bureaus work together to implement actions. The City also works with watershed councils, community groups, business organizations and other jurisdictions, both in Portland and upstream of Portland's watersheds. Improving watershed health is truly a citywide effort.

Role of the Annual Report

The Watershed Plan Annual Report documents progress toward the protection and improvement strategies identified in the Watershed Plan. The Annual Report summarizes the watershed-related projects and other activi-

ties implemented each fiscal year. This includes all applicable activities that could be identified that were implemented or coordinated on by all City bureaus.

This report documents activities implemented in Fiscal Year 2005 (FY 2005, covering July 2004 through June 2005). The report also highlights selected programs and projects to be implemented or coordinated on by one or more City bureaus in the upcoming fiscal year to illustrate how the City will continue working toward the objectives.

Each future Annual Report will be refined through collaboration of all applicable City bureaus. The continuous improvement of Citywide coordination will be the cornerstone of the implementing, tracking, and reporting of watershed-related activities to achieve the watershed objectives.

The City will continue providing separate periodic reports to regulatory agencies as part of its compliance responsibilities. Data on environmental conditions (e.g. stream flow and temperature) gathered through monitoring activities will also be available through a separate reporting process.

For more information on the development of the Annual Report, please refer to Technical Memo AR.

Watershed Performance Measures

Annual progress toward implementing the Watershed Plan strategies and actions is reported using a set of performance measures. Performance measures, as used in this document, indicate the City's success at implementing actions known to improve watershed health. Performance measures were developed to capture the range of activities being conducted so that annual achievement could be reported in a quantifiable way.

Watershed performance measures do not measure the impact of specific projects on the environment; rather, they measure whether the City has accomplished specified actions. For example, the enhancement of riparian areas is known to improve watershed health through instream temperature reductions coming from shading; but the performance measure, as currently defined, would capture the acres of riparian area enhanced not the change in stream temperature (see inset for performance measures).

The Performance measures and the parameters tracked and reported for them will continue to be refined through city-wide coordination to improve reporting on progress toward achieving watershed health. Over time, the system for tracking and reporting on implementation will be refined to the point that future Annual Reports will also include estimates of the watershed health benefits of implemented activities.

Watershed Performance Measures

Stormwater Strategy Performance:
- Stormwater Flow Management
- Stormwater Pollution Management

Aquatic and Terrestrial Enhancement Strategy Performance:
- Aquatic Enhancement
- Terrestrial Enhancement

Revegetation Strategy Performance:
- Revegetation
- Street Trees

Protection and Policy Strategy Performance:
- Development Management
- Resource Protection

Operations and Maintenance Strategy Performance:
- System Improvements
- System Maintenance

Education, Involvement, and Stewardship Strategy Performance:
- Education
- Involvement
- Outreach

For more information on the development of performance measures, please refer to Technical Memo AR.

2005 WATERSHED ACHIEVEMENT

Achievement by performance measures for FY 2005 is summarized in the following section. For many performance measures, reporting is limited to quantifying activities conducted (for example, number of stormwater flow management projects). For this first annual report, data available for reporting achievement toward performance measures was limited. Parameters tracked and monitored will continue to be refined so that progress can be reported in more detail in the future. Future annual reports will also describe the expected watershed benefits of the implemented activities.

The individual activities conducted, which contributed to this reporting, are listed in the Appendix.

Stormwater Strategy Performance:

Stormwater Flow and Pollution Management

- Installed 1,310 linear feet of swale
- Installed an additional 156 swales and planters
- Installed 7 additional projects to mitigate impervious area (swales, planters, pavers)
- Reviewed 207 industrial files to evaluate impacts to stormwater system
- Inspected 99 industries to identify Best Management Practices (BMPs) to minimize or remove exposure to stormwater
- Administered 254 stormwater permits
- Corrected 11 illicit discharges

Revegetation Strategy Performance:

Revegetation

- In partnership with public and private entities, planted:
  ✔ 36,100 trees ✔ 63,550 shrubs
- In partnership with Watershed Councils and SOLV, planted:
  ✔ 7,771 trees and shrubs

Street Trees

- In partnership with Friends of Trees, planted:
  ✔ 1,500 street trees ✔ 9 large canopy trees

Protection and Policy Strategy Performance:

Development Management

- Addressed 1,600 calls to the spill protection hotline (503-823-7180)
- Conducted 10,345 erosion control inspections
- Opened 290 erosion control complaints
- Closed 267 erosion control complaints

Resource Protection

- Acquired 30 acres for restoration and protection

Operations and Maintenance Strategy Performance:

System Improvements

- Used bio-diesel in all city diesel trucks
- City bureaus continue to follow Integrated Vegetation Management and Integrated Pest Management Policies to reduce pollutants and cost
- City bureaus continued application of trenchless liner repair system

System Maintenance

- Constructed, repaired or replaced 330 inlets, 2,680 feet of inlet lead, 4,941 feet of culverts
- Inspected all 122 public pollution reduction facilities
- Inspected 319 private stormwater management facilities
- Inspected 364 outfalls
- Inspected and cleaned 922 sumps
- Inspected and cleaned 16,500 catch basins
- Inspected and cleaned 11,700 feet of swales and ditches

Education, Involvement, and Stewardship Strategy Performance:

- Awarded 24 stewardship grants for a total of $57,750
- Conducted or sponsored over 89 events reaching 5,425 people
- Attended and presented at 161 events reaching more than 10,000 people
- Trained 256 teachers and volunteers
- Engaged 1629 tree planting, maintenance, and education volunteers
- Engaged 749 stormwater management volunteers who contributed 3,940 hours
- Reached 23,018 K - 12 students in classroom and field activities
- Engaged over 330 community groups and businesses
- Developed publications, flyers, and advertisements to reach an estimated audience of 3,000,000 people

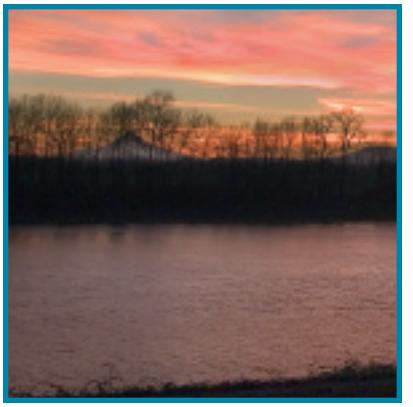
Aquatic and Terrestrial Enhancement Strategy Performance:

Stream and Terrestrial Enhancement

- Enhanced 11,350 feet of stream bank, in addition to 81 acres - this includes both aquatic and terrestrial habitat

2006 AND BEYOND: EXAMPLE WATERSHED ACTIVITIES

This plan sets a policy course that expresses Portland's commitment to improve watershed health and protect and enhance its natural resources. The products of the Plan provide a watershed context for current and future City decision making efforts so that they can most effectively and efficiently contribute to the watershed health objectives. The Portland Watershed Management Plan identifies a variety of strategies and actions to protect and improve watershed health. It also identifies where these activities may potentially best be applied throughout the City over the long-term and influence or be incorporated into other City priorities and efforts. This information is based on the best science and analysis currently available and used to produce the Watershed Priority Map that highlights the priority areas for applying these activities.



The products of the Plan provide a watershed context for current and future City efforts so that they can most effectively and efficiently contribute to watershed health objectives. The pursuit of these actions will continue in FY 2006 and beyond through a variety of ongoing programs and individual projects, and changes to the way many other City activities are conducted. Although the City works on hundreds of activities each year that benefit watershed health, this work remains only a portion of the long-term effort to protect and improve watershed health.

This section provides further detail on eight example programs and seven example priority projects in FY06. The program examples apply citywide; the site-specific projects fall within the Priority Areas identified on the Watershed Priority Areas Map. These selected activities illustrate the type of work being conducted. They represent only a fraction of the work conducted by City Bureaus, as evidenced by the broader sampling of activities that will be reported for FY 2006, and of the long-term implementation work needed to reach the watershed health goals.

EXAMPLE PROGRAMS

Downspout Disconnection Program
Lead Bureau: Environmental Services

Strategies Addressed: Stormwater

Education, Involvement, and Stewardship

The Downspout Disconnection Program focuses on disconnecting downspouts at residential properties in areas of the City east of the Willamette River served by the combined sewer.

The program disconnects thousands of residential downspouts each year. This results in the infiltration and treatment of stormwater runoff from hundreds acres that would otherwise enter the combined sewer system. In addition, information on disconnection is provided to thousands of people through presentations at community events and at community meetings and thousands more have been reached through an ongoing media campaign. Disconnection efforts enlist the help of hundreds of volunteers and community organizations.

Disconnected downspout

Removing the stormwater runoff from the combined sewer system and allowing it to infiltrate helps reduce Combined Sewer Overflows (CSOs) and improves overall water quality. Since 1996, more than 44,000 homeowners have disconnected downspouts, removing over a billion gallons of roof water per year from the combined sewer system. The Downspout Dissconnection Program also helped reduce the size of the East Side Big Pipe Portland's Bureau of Environmental Services (BES) will build to control CSOs. Smaller pipes mean savings for Portland sewer ratepayers who are funding the CSO program. Portland has already reduced annual CSO volume by three billion gallons and the 44,000 homeowners who have disconnected downspouts are an important part of that success.

Whitaker Ponds Nature Center
Lead Bureau: Portland Parks and Recreation

Strategies Addressed: **Education, Involvement, and Stewardship**
Revegetation
Aquatic and Terrestrial Enhancement

Whitaker Ponds is a great example of what collaborative partnerships can achieve. The 12-acre Whitaker Ponds site was a junkyard and illegal dumping ground on the banks of the Columbia Slough in north Portland. BES teamed up with Metro, Portland Parks and Recreation (Parks), the Columbia Slough Watershed Council (CSWC), and the Trust for Public Lands to purchase and restore the site. Whitaker Ponds is now an environmental learning center managed by Parks and home to the CSWC office, library, and its small staff. The site is used to provide youth and adult education programs, public access to open space above the Slough, community involvement events, and volunteer restoration opportunities.

The property is managed by Parks Natural Areas Program as home to numerous city and public involvement, education, and stewardship efforts. Events are sponsored by BES and CSWC. In 2005, the site served as an outdoor environmental classroom for hundreds of North and Northeast Portland school students to learn about watershed function, water quality, stream restoration, and the ecology of the Columbia Slough watershed. Hundreds of citizens participated in involvement and volunteer events at the site. In addition, revegetation and aquatic restoration projects were implemented on the site in 2005 by volunteer efforts.

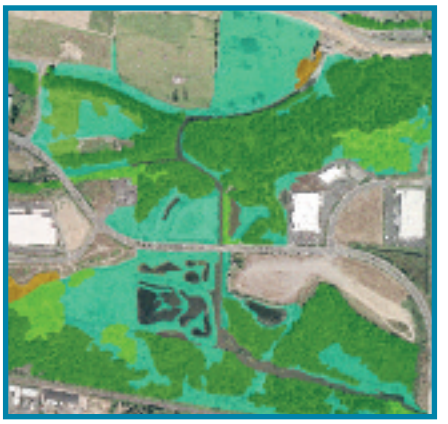
The ongoing operation of this site and annual events provide public education, involvement, and restoration benefits that contribute to nearly every watershed objective. These efforts result in restoration of aquatic habitat and hydrologic function, pollutant source reduction, native forest restora-

tion, water quality treatment, increased habitat connectivity, and citizen understanding of watershed practices. The site is home to numerous native aquatic, bird, reptile, and mammal species.

Natural Resource Inventory Update
Lead Bureau: Bureau of Planning

Strategies Addressed: **Protection and Policy**
Aquatic and Terrestrial Enhancement
Revegetation
Education, Involvement and Stewardship

The Natural Resources Inventory Update project is producing an updated citywide inventory of riparian and upland resource areas using new data, recent scientific information, and state-of-the-art technologies and tools. The effort focuses on areas characterized by streams, rivers, wetlands, and other water bodies, floodplains, steep slopes, and significant riparian and upland vegetation. Products will include maps and reports describing landscape features and significant resource areas, and a strategy for keeping the inventory current over time.



mapping existing vegetation

The new maps and reports will supplement existing City natural resource inventories that were developed over the last 15 years. The new inventory information will be helpful in informing a broad array of City and community plans, programs and projects. For example, the new inventory maps and reports can assist in identifying priority areas for protection and restoration activities such as land acquisition, revegetation, public education, and implementation of regulations to protect natural resources. The inventory products will also inform area-specific planning efforts, such as the River Plan, and will be helpful in developing strategies for compliance with multiple regional, state and federal regulatory obligations (e.g., Metro Nature in Neighborhoods Program, Clean Water Act TMDL and Stormwater, and Endangered Species Act requirements).

The Planning Bureau is completing this update in consultation with other bureaus, agencies, and technical experts. The current work will be completed over the next couple of years, and will include the development of a strategy to update the inventory over time.

Sustainable Stormwater Management Program NE 131st and Fremont Green Street Project Lead Bureau: Environmental Services

Strategies Addressed: Stormwater

The Sustainable Stormwater Management Program (SSMP) provides design and technical assistance to property owners, developers, engineers and architects to promote onsite stormwater management. The SSMP demonstrates methods that manage stormwater at its source while providing environmental and economic benefits. This includes retrofitting commercial / industrial properties and streets with stormwater control measures including swales, planters, and rain gardens. Key efforts of the SSMP are monitoring demonstration projects to evaluate their performance and cost effectiveness for water quantity and quality improvements and to actively engage in outreach efforts to other city bureaus, property owners, watershed managers, and neighborhood associations. The program also provides incentives to public and private property owners to manage stormwater onsite.

The SSMP is administering a U.S. Environmental Protection Agency (EPA) grant of $1.25 million to fund over 25 innovative public and private projects throughout the city that demonstrate sustainable, low-impact stormwater management solutions. An additional appropriation from EPA for nearly $1 million will be administered through the SSMP for additional innovative projects.

The landscaped curb extension at NE 131st and Fremont is an SSMP project. This facility utilizes natural watershed processes such as infiltration, interception, evapotranspiration, detention, and filtration to manage stormwater runoff at its source. This project was the first of its kind to both manage street runoff and accommodate a ramp crossing for handicap accessibility. Approximately 400 square feet of asphalt was removed on either side of the ramp and vegetated with a variety of plants. Stormwater enters the vegetat-

ed portion on the west side through a curb cut, and is allowed to flow under the ramp to the east vegetated portion via a steel grate.

The NE 131st and Fremont Green Street was the first collaborative process between the BES Sustainable Stormwater Management Program, the Portland Office of Transportation (PDOT), and the CSWC. The CSWC helped fund the project (approximately $22,000) and assisted with community outreach efforts to the Argay neighborhood. The SSMP designed the project with input from PDOT. The City's Bureau of Maintenance (BOM) constructed the project beginning in late August 2005 and finishing the first of September. Portland Parks and Recreation installed the landscape and will continue to maintain it during the two-year plant establishment period.

This project manages approximately 5,000 square feet of stormwater runoff from the surrounding impervious area. The soil and vegetation slows the flow of runoff, filters sediments and pollutants, and allows the stormwater to soak into the ground, reducing the burden on the combined sewer system and recharging groundwater. This project is viewed as the first of many city-wide collaborative projects with PDOT to manage stormwater runoff from streets while enhancing pedestrian safety and adding an attractive element to neighborhoods and the urban environment.

Urban Forestry Program
Street Tree Planting and Maintenance
Lead Bureau: Portland Parks and Recreation

Strategies Addressed: Stormwater

Education, Involvement, and Stewardship

Portland Parks and Recreation maintains and manages Portland's urban forest. The Parks Urban Forestry Program plants, inspects, and maintains the 140,000 publicly owned trees in parks, along streets and around public buildings. The program also identifies planting opportunities and needs and coordinates the management and administration of the urban forest. The Neighborhood Tree Liaison Program conducts classes on tree care, tree biology, tree planting, preservation, and identification. Neighborhood Tree Liaisons also work with neighborhood associations as a resource for tree information.

These outreach programs train, educate and involve hundreds of residents and students. City collaboration and funding to schools, neighborhood associations, and organizations such as Friends of Trees results in the planting of hundreds of street trees throughout the city each year.

Street trees have significant benefits toward every watershed goal. The leaves of a mature street tree intercept an average of 760 gallons of rainfall a year, stabilizing soil, reducing erosion, and mitigating flooding. The average tree cleans 330 pounds of carbon dioxide from the atmosphere through direct sequestration in the tree's wood and from reduced power plant emissions due to cooling energysavings. An average tree also absorbs ten pounds of pollutants from the air each year, including four pounds of ozone and three pounds of particulates.

An average street tree provides an estimated $273 a year in reduced costs for air conditioning, erosion control, stormwater control and treatment, and air pollution. Unlike structural investments that depreciate, a tree's value increases with each passing year. Street trees also contribute to neighborhood livability by reducing city noise and glare, and by calming and slowing traffic. Trees increase home property values 7 to 21 percent, depending on the number and size of the trees.

Volunteer tree planting event

Street trees provide habitat for migratory birds, and other wildlife and street tree planting and outreach programs provide public education and involvement.

Willing Seller Property Acquisition Efforts
Lead Bureau: Environmental Services
Portland Parks and Recreation

Strategies Addressed: Protection and Policy

Aquatic and Terrestrial Enhancement

The City of Portland is working with Metro to develop a unified proposal regarding natural area acquisition priorities. This is an effort to identify sites with high value natural resources, that are priorities for multiple bureaus, and that are at greatest risk from development. Metro is proposing an open spaces bond measure to raise funds for acquisition of high priority sites from willing sellers. The Metro bond measure will likely go before voters in November 2006.

In addition to this effort, the City currently acquires property from willing sellers for several purposes, such as high value properties that increase the connectivity of Forest Park, properties needed for stormwater facilities, and flood-prone properties along Johnson Creek through the Johnson Creek Willing Seller Land Acquisition Program. Acquired properties are generally cleared of all structures and protected from future development through deed restrictions. These properties are then often used to expand the natural areas parks system.

Past project sample; Brookside wetland and flood storage

Property acquisitions are collaborations with willing sellers and often involve the donation of part or all of the value of the property by landowners interested in supporting the natural resource elements of our city.

Acquisition and protection of high-value lands is a multi-objective watershed approach help protect water quality and natural hydrology functions, provide fish and wildlife habitat, stabilize soils and stream banks, protect against property damage on floodplains, create restoration opportunities, and expand public recreation opportunities through natural area aesthetics and trail systems.

Stormwater Collection and Conveyance System Cleaning

Lead Bureaus: Portland Department of Transportation, Bureau of Maintenance

Strategies Addressed: Operation and Maintenance

Cleaning the stormwater collection and conveyance system provides source control of stormwater contaminants for more than 28,000 acres served by the combined sewer system and 66,000 acres served by the separated storm system. Cleaning the stormwater collection system includes cleaning of streets and curbs on selected arterial and residential streets in separated areas that drain directly to the City's streams and Willamette River and maintenance for BES stormwater collection and conveyance infrastructure, including all pipes, culverts, trash racks, sumps, inlets, and stormwater facilities.

This work is done by the Environmental Group of the Bureau of Maintenance. In the 2004 fiscal year, the group cleaned 715 sumps and sedimentation manholes, 11,400 catch basins, 132,300 linear feet of ditch, and 24,800 linear feet of culverts. A total of 12,900 maintenance visits were conducted and all 77 detention and water quality pond pollution reduction facilities were inspected.

These efforts result in keeping thousands of pounds of metals, oils and grease, sediment, nutrients, and other contaminants out of stormwater.

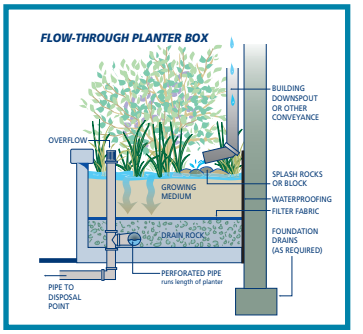
Stormwater Management Manual Implementation
Lead Bureau: Environmental Services
Bureau of Development Services

Strategies Addressed: Protection and Policy

Stormwater management is a key element in maintaining and enhancing the environment within Portland. The City of Portland has developed a comprehensive Stormwater Management Manual to provide design professionals with specific requirements for reducing stormwater runoff and pollution from new development and redevelopment within Portland. The manual's requirements apply to all development, both public and private, over 500 square feet in impervious area. Infiltration of stormwater is required to the maximum extent practicable and vegetated facilities are the preferred option for all non-rooftop impervious areas.

The first Stormwater Management Manual was implemented in 1999 and has been updated to the current version of September 2004. Manual requirements are applied through the development review process by BES Development Services and BDS Site Development. Field inspections of private facilities during construction are conducted by BDS in conjunction with other site inspections. After construction, BES inspects private facilities to ensure proper functioning and maintenance (however there is not enough staff to inspect all facilities every year, so only a small percentage of all facilities are regularly inspected). The Stormwater Advisory Committee is a group of professionals and citizens appointed by City Council to oversee manual revisions.

The Stormwater Management Manual is one tool that the City uses to meet federal water quality requirements. By requiring pollution reduction, flow control and, where possible, infiltration for new and re-development within the City, we protect the health of our streams and rivers. Retaining and treating stormwater on site prevents erosion in small creeks, reduces temperatures and pollutant loading, protects groundwater, and contributes to prevention of CSOs. DEQ has approved the manual as an approach to protect groundwater resources in sensitive areas. The manual is also an important component of the CSO program, reducing flows to the combined system and sewage overflows to the Willamette River.



EXAMPLE PROJECTS

Tryon Creek Pipe Protection and Stream Enhancement Project
Lead Bureau: Environmental Services

Strategies Addressed: Operations and Maintenance
Aquatic and Terrestrial Enhancement

This project is a bioengineered bank restoration project along a portion of a 27-inch concrete sanitary pipe that was exposed along the northern bank of Tryon Creek in Tryon Creek State Natural Area. The project consists of two main components: constructing a bioengineered stream bank out of logs and other natural materials to protect the sanitary pipe, and subsequent stream enhancement work to improve instream habitat for salmon.

The second phase of this project is being constructed in FY 2006, following completion of the first phase in September of 2004. This project is being implemented by the BES Watershed Services and Maintenance Engineering groups in collaboration with a variety of agencies and public groups. Funding came from BES Maintenance Engineering, BES Watershed Services, River Renaissance, a NOAA grant, a Nature Conservancy grant, and the BES Revegetation Program. Match resources came from Oregon State Parks, Tryon Creek Watershed Council, and the Friends of Tryon Creek State Park. Other partners were Portland Parks Urban Forestry (moving large wood) and PDOT (survey work).

This project will result in the protection of the sanitary sewer infrastructure at the site and the enhancement of about 300 feet of Tryon Creek. The enhancement includes in-stream habitat improvements, restoration and native planting of about 7 acres of critical riparian habitat, and citizen involvement in restoration activities. The project will improve water quality (sediment filtration and stream temperature), vegetative structure, flood storage capacity, bank stability, riparian and flood-plain connectivity, and in-stream refugia.

Tryon Creek restoration project

Environmental Code Improvement Project
Bureau Lead: Bureau of Planning

Strategies Addressed: Protection and Policy

The purpose of this project is to make Portland's existing environmental regulations clearer, simpler, and more cost-effective and equitable, while continuing to protect significant natural resources and providing additional incentives for restoration. The code improvements will apply to new development and redevelopment within the environmental overlay zones of the City of Portland and of the Multnomah County urban pockets.

In August 2005 the City Council adopted the recommended package of code amendments, administrative rules and follow-up tasks. The changes went into effect on September 26, 2005. The Bureau of Planning led the project, and the effort included extensive collaboration with the Bureaus of Development Services, Parks and Recreation and Environmental Services, other agencies, community organizations, neighborhood leaders and residents. Stakeholders helped define problems and opportunities, and develop goals, criteria, and solutions. Staff estimates that program changes can be accommodated within existing budgeted resources.

The Environmental Code Improvement project will advance watershed health objectives for protection of natural resources, stormwater management, and community stewardship. Project benefits include reduced cost and time required to obtain permits for specified resource enhancement projects, public recreational trails, and small rights-of-way and stormwater outfalls. The code changes remove regulatory impediments to site restoration and encourage enhancement of degraded sites. Simplified permitting options are only available for projects that meet standards designed to prevent adverse impacts on natural resources. A new approach for enforcing environmental violations will accelerate site remediation and discourage repeat violation. Extensive stakeholder participation in the project resulted in overall acceptance and support for the outcome, and an improved perception of the program as a whole.

SW Texas Green Street Project
Lead Bureau: Portland Department of Transportation and Environmental Services

Strategies Addressed: **Protection and Policy**
Aquatic and Terrestrial Enhancement
Stormwater

This project includes construction of stormwater facilities to treat drainage from a 17-acre basin. The proposed design incorporates swales along streets to improve water quality and relieve neighborhood stormwater problems including basement flooding, acquisition of a 0.62-acre wetland at the Stephens Creek headwaters, and creation of a wetland stormwater facility. The project is located on SW Texas between 26th and 28th Avenues, in the Stephens Creek subwatershed of the Willamette River Watershed.

The project is in design with construction anticipated to begin in May 2006 and end by fall 2006. This project is jointly managed by BES and the PDOT in consultation with the Bureau of Water Works. A local improvement district will pay for the street improvements, estimated at $940,000. BES will pay for the stormwater improvements with $225,000 in operating funds (the land acquisition), $77,000 from an Innovative Wet Weather Program grant, and $711,000 in capital improvement funds.

Stephens Creek is one of Portland's last free-flowing streams in the southwest draining directly to the Willamette. The mouth of Stephens Creek is high value and critical off-channel habitat area for Willamette River fish communities. This area is one of the most productive in the City for Salmon diversity and abundance. Stormwater from the entire Stephens subwatershed flows to the outfall at the mouth of the creek. BES identified alteration of streamflow conditions and the associated water quality problems (e.g. temperature, sediment, and suspended solids), caused by impervious surfaces in the upper reaches of the subwatershed, as the highest priority problem in the basin.

Beaverton Hillsdale Corridor Pre-design Project
Lead Bureau: Environmental Services

Strategies Addressed: **Stormwater**
Revegetation
Aquatic and Terrestrial Enhancement
Protection and Policy

This pre-design project includes assessment of actions focusing on water quality, stormwater management, instream, riparian and upland habitat improvements, land acquisitions, stream enhancement, culvert and stormwater outfall retrofit and revegetation. This project encompasses the Fanno Creek mainstem, Beaverton Hillsdale Highway, and the drainage area associated with it.

The project is scheduled to be completed by summer 2007. The project pre-design will be managed within the BES Watershed Services Group in coordination with other BES groups, the public and others as determined. This project is part of a broad Fanno/Tryon predesign project funded by BES for fiscal years 2006 and 2007.

The project will provide water quality benefits to help meet the basin TMDLs and Portland Watershed Management Plan objectives.

development along Fanno Creek

Parking lot prevents rain from soaking into the ground

Lents Crossing
Lead Bureau: Environmental Services

Strategies Addressed: Aquatic and Terrestrial Enhancement
Operations and Maintenance

The Lents Crossing project's main purpose is to protect an exposed sewer pipe in Johnson Creek. The Lents Interceptor runs from east of I-205 to a pump station at McLoughlin Blvd. The 60 inch pipe was built in 1922 and carries up to 20 million gallons a day of combined sewage and stormwater during winter months and about 6 million gallons a day of sewage during the summer. The pipe was originally installed 5 feet below the bottom of Johnson Creek. Because of major alterations to the creek in the 1930s and increased development over time, the creek banks have eroded considerably and low summer flows now run under part of the pipe. The exposed pipe is a threat to public health and safety.

BES will reinforce the pipe, even out the grade of the creek with the adjacent floodplain in Tideman Johnson Park and place large wood and rock in the creek to protect the pipe and help slow stream flow. Large wood jams and rock will be placed in three locations, and scattered less densely throughout the project reach of the creek.

The project includes some minor improvements to Tideman Johnson Park to help protect sensitive natural areas and direct traffic to areas more suitable for access. The project designers have made an effort to minimize the amount of tree loss. The trees that are taken down will be used as habitat in the creek.

Lents Crossing construction is projected for April through November 2006. The work will be done during the in-stream work window for Johnson Creek when flows are the lowest and there is the least potential for damage to fish habitat. BES is leading the project construction. Parks staff are leading planning, natural resource and maintenance work within the parkland

portion of the project. Funding is provided by BES and Parks Capital Improvement Project funds in FY 06 to construct project and park infrastructure improvements.

BES Outreach staff are working with four Neighborhood Associations (Ardenwald/Johnson, Woodstock, Eastmoreland and Brentwood/Darlington,) nearby residents and the Johnson Creek Watershed Council, to assure stakeholders are given regular project updates.

This project will protect the pipe and improve fish and wildlife habitat. Approximately 2,000 cubic yards of material will be removed, making way for 800 linear feet of newly created stream channel and floodplains to provide stormwater interception, storage and filtration functions, and improve water quality. Three logjams will enhance these areas as habitats for salmon by adding structural complexity, including more than 150 logs and 45-50 boulders. Nearly 1,800 linear feet of stream channel will be improved and shaded with 1,500 newly planted native trees providing healthy wildlife habitat.

Integrated Taggart D Pre-design
Lead Bureau: Environmental Services

Strategies Addressed: Operations and Maintenance
Stormwater

The Taggart D combined sewer basin has a history of significant basement flooding problems and poor sewer pipe condition. BES is responsible for maintaining sewer service and such problems have traditionally been approached by conducting a pre-design project that is focused on finding piped solutions, such as increasing the size of sewer pipes to reduce basement flooding and replacing pipes that are in poor condition. The Integrated Taggart D Pre-design, however, is taking a different approach. BES will address multiple objectives through one pre-design by developing packages of solutions that resolve basement flooding, address pipe rehabilitation needs, and improve watershed health.

Staff responsible for the Integrated Taggart D Pre-design work in the BES Engineering Services and Watershed Services groups. Staff from other City bureaus, including Planning, PDOT, and Parks, sit on advisory teams. In October 2005, staff had identified four preliminary alternatives to address the basin's problems. Solutions include pipe replacement, pipe upsizing, stormwater solutions (e.g., green streets, stormwater planters), revegetation and pollution prevention techniques. Staff will present these alternatives to the advisory teams for their review and feedback. The revised versions will move forward to the Alternative Evaluation phase. In this phase, each alternative will be measured against the project goals. An alternative that most effectively meets the project goals will be selected and recommended for implementation. BES staff will introduce the project to Neighborhood and Business Associations in the Taggart D basin in October

and November 2005, and will return to present more detailed information as it becomes available. The Integrated Taggart D Pre-design is scheduled to be complete by December 2006.

This pre-design will result in:

- A reduction in basement flooding in the Taggart D basin.
- A reduction in the volume of stormwater that enters the combined sewer system.
- Improvement of failing infrastructure.
- Improvement of surface and groundwater hydrology.
- Improvement of the quality of stormwater discharged to the Willamette River.
- Improvement of sustainability and community livability.

Big Four Corners Restoration Project
Lead Bureau: Portland Parks and Recreation and Environmental Services

Strategies Addressed: **Revegetation**
Aquatic and Terrestrial Enhancement
Protection and Policy

This project includes acquisition and restoration of 70- and 44-acre parcels located at the confluence of two branches of the Columbia Slough known as the Big Four Corners. Historically much of this site was a complex of lakes, ponds and sloughs. This project will enable the City to protect and improve high quality habitat for native fish and wildlife populations while enhancing enjoyment of the area by recreational boaters, hikers and wildlife watchers. These sites are adjacent to 47 acres of other City of Portland properties currently managed as natural area.

This is the last large contiguous patch of native, remnant floodplain habitat in the eastern region of the watershed. The Big Four Corners region has been ranked highly by City of Portland's Bureau of Planning for existing natural resource value. The Portland Watershed Management Plan also identifies the Big Four Corners area as a priority area to pursue watershed actions to meet habitat and biological community goals. Because this property is a significant piece of the Big Four Corners Habitat Area, and because of the cool water that flows into the Slough along its property line, acquisition of this parcel is a high priority project in the Columbia Slough Watershed Council Action Plan.

The parcel will be purchased in fall 2005 and restoration work will begin in winter 2006 and continue for 5 years. The purchase and restoration of the site will be funded by the Bureau of Environmental Services, Portland Parks and Recreation, a grant from the Oregon Watershed Enhancement Board, and the donation of a portion of the property's value by the landowner.

Benefits of this project include the protection and restoration of 114 acres and the restoration of 10,000 feet of bank. This will further the City's efforts to comply with the anticipated temperature TMDL listing for the Columbia Slough by revegetating a riparian-forested buffer, providing shade to surface waters and decreasing water temperatures. The project will achieve a 50-70% canopy when completed and provide connectivity to 47 acres of adjacent City-owned natural area. The area also provides interception infiltration of rainwater and flood storage. In addition, it provides erosion control and sediment trapping, pollution nutrient retention and removal, recreation, aesthetics, fish and wildlife habitat, and increased native plant diversity.

aerial view of Big Four Corners area

Columbia Slough has important wildlife habitat

ANNUAL REPORT APPENDIX

This table details all project and program activities conducted in 2005.

STRATEGY

STORMWATER

ACTIVITY	NUMBER	UNITS
Installed	1,200	linear feet of swale on SW Hewett Blvd
Installed	30	linear feet of swale on SW Sunset Drive
Installed	80	linear feet of swale on SW Orchid Drive
Installed	**1,310**	**linear feet of swale**
Installed	120	swales at New Columbia
Installed	30	infiltration planters at New Columbia
Installed	2	infiltration swales at Lents III LID
Installed	2	streetside planters on SW Gaines in South Waterfront
Installed	2	curb extension swales at NE Siskiyou and SE Ankeny
Installed	**156**	**swales and planters**
Installed	1	Westmoreland Pavers
Installed	1	Rebuilding Center
Installed	1	Mississippi Commons
Installed	1	New Seasons swales at SE Division
Installed	1	Astor Elementary School
Installed	1	Atkinson School disconnection and swale
Installed	1	SW 12th & Montgomery planters and pavers
Installed	**7**	**projects**
Reviewed	**207**	**industrial files to evaluate impacts on the stormwater system**
Inspected	**99**	**Industries to identify BMPs to minimize or remove exposure to stormwater**
Administered	111	permits for direct discharges to waterways
Administered	143	Permits for industries and associated tenants with permitted discharges to the municipal stormwater system
Administered	**254**	**Stormwater permits**
Corrected	**11**	**illicit discharges**

AQUATIC AND TERRESTRIAL ENHANCEMENT STRATEGY

ACTIVITY	NUMBER	UNITS
Enhanced	10	acres
Enhanced	28	acres
Enhanced	34	acres
Enhanced	2	acres
Enhanced	7	acres
Enhanced	**81**	**acres**
Enhanced	2,440	linear feet of stream bank
Enhanced	4,306	linear feet of stream bank
Enhanced	1,740	linear feet of stream bank
Enhanced	50	linear feet of stream bank
Enhanced	2,817	linear feet of stream bank
Enhanced	**11,353**	**linear feet of stream bank**

REVEGETATION

Planted	9,291	trees
Planted	2,460	trees
Planted	19,754	trees
Planted	1,000	trees
Planted	3,600	trees
Planted	**36,105**	**trees**
Planted	14,687	shrubs
Planted	13,010	shrubs
Planted	29,114	shrubs
Planted	1,700	shrubs
Planted	5,039	shrubs
Planted	**63,550**	**shrubs**
Planted	2,000	trees and shrubs
Planted	3,200	trees and shrubs
Planted	1,666	trees and shrubs
Planted	109	trees and shrubs

STRATEGY

REVEGETATION

ACTIVITY	NUMBER	UNITS
Planted	450	trees and shrubs
Planted	296	trees and shrubs
Planted	50	trees and shrubs
Planted	**7,771**	**trees and shrubs**
Planted	1,008	street tree plantings
Planted	500	street tree plantings
Planted	**1,508**	**street trees**
Planted	**9**	**large canopy trees**

PROTECTION

Addressed	**1,600**	**calls to the spill hotline (503-823-7180)**
Conducted	**10,345**	**erosion control inspections**
Opened	**290**	**erosion control complaints**
Closed	**267**	**erosion control complaints**
Acquired	8	acres
Acquired	22	acres
Acquired	**30**	**acres**

OPERATIONS and MAINTENANCE

Converted	**all**	**city diesel-powered trucks to biodiesel**
Continued		**to follow IVM and IPM**
Continued		**use of trenchless liner repair system**
Constructed, repaired, or replaced	**330**	**inlets**
Constructed, repaired, or replaced	**2,680**	**linear feet of inlet lead**
Constructed, repaired, or replaced	**4,941**	**linear feet of culvert**

STRATEGY

OPERATIONS and MAINTENANCE

ACTIVITY	NUMBER	UNITS
Inspected	122	public pollution reduction facilities (2x each)
Inspected	319	private stormwater management facilities
Inspected	364	outfalls
Inspected and Cleaned	922	sumps
Inspected and Cleaned	16,500	catch basins
Inspected and Cleaned	11,700	linear feet of swales and ditches
Removed	11 million gallons	non-stormwater discharge from the Portland Building

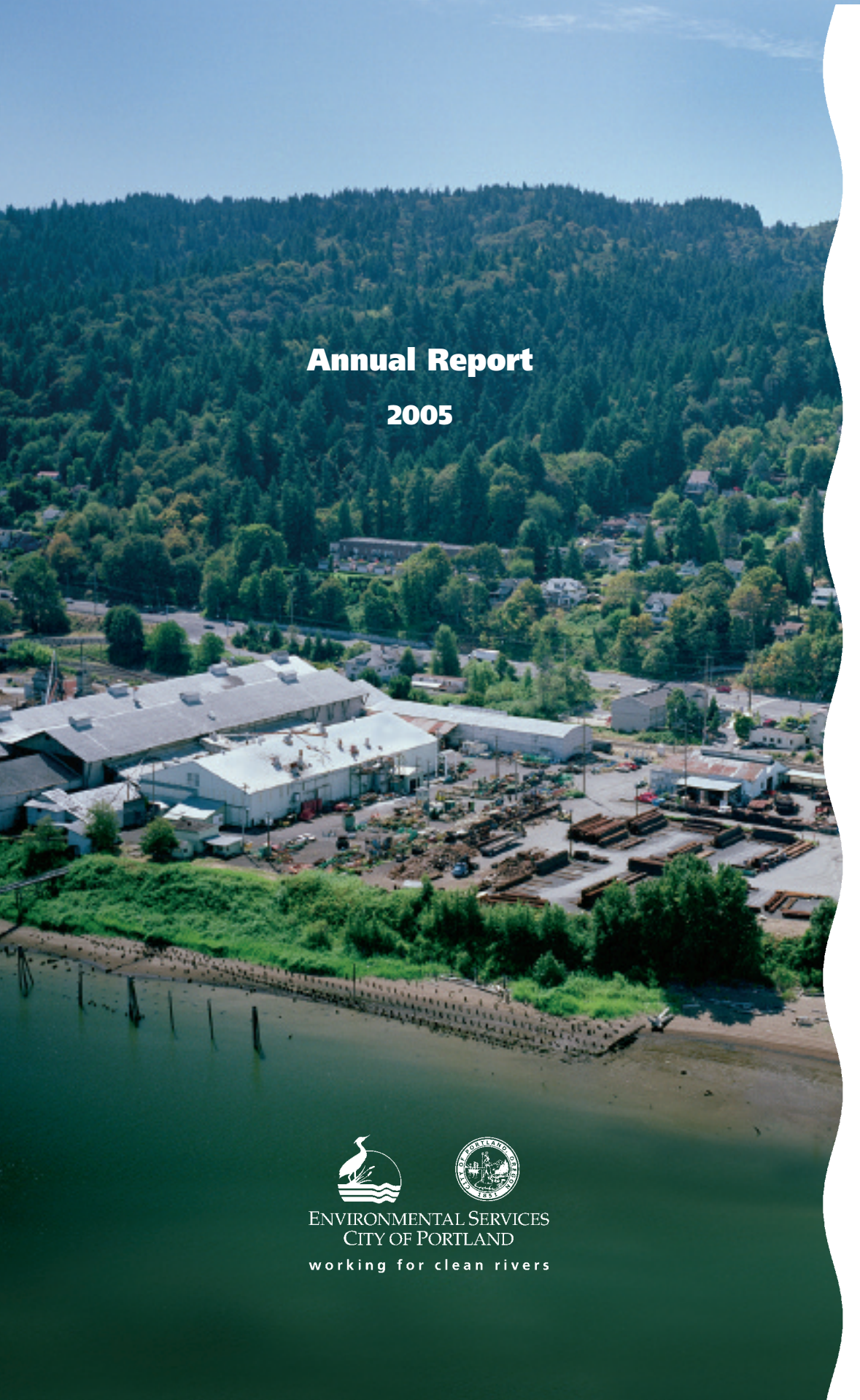
EDUCATION, INVOLVEMENT, STEWARDSHIP

- Awarded 24 stewardship grants for a total of $57,750
- Conducted or sponsored over 89 events reaching 5,425 people
- Attended and presented at 161 events reaching more than 10,000 people
- Trained 256 teachers and volunteers
- Engaged 1629 tree planting, maintenance, and education volunteers
- Engaged 749 stormwater management volunteers who contributed 3,940 hours
- Reached 23,018 K - 12 students in classroom and field activities
- Engaged over 330 community groups and businesses
- Developed publications, flyers, and advertisements to reach an estimated audience of 3,000,000 people

(additional details to come with final report)

ACRONYMS

BDS	Bureau of Development Services
BES	Bureau of Environmental Services
BOM	Bureau of Maintenance
BOP	Bureau of Planning
CSO	Combined Sewer Overflow
CSWC	Columbia Slough Watershed Council
DEQ	Department of Environmental Quality
EPA	Environmental Protection agency
ESA	Endangered Species Act
PDOT	Portland Office of Transportation
SSMP	Sustainable Stormwater Management Program
TMDL	Total Maximum Daily Loads



Annual Report

2005

ENVIRONMENTAL SERVICES
CITY OF PORTLAND
working for clean rivers

2005 PORTLAND WATERSHED MANAGEMENT PLAN