

# *Chambers-Clover Creek Watershed*

## *Annual Report 2005-2006*



Chambers-Clover Creek Watershed Council



Pierce County Public Works & Utilities Water Programs Division

## *Introduction*

The Chambers-Clover Creek Watershed is located in central Pierce County, and totals 149 square miles in area. The watershed is home to over 300,000 residents and includes seven cities, portions of unincorporated Pierce County, three military reservations, and one drainage district. The Chambers-Clover Creek Watershed also includes a limited amount of forest and other natural areas, and is home to many sensitive species of fish and wildlife including Chinook, coho, and chum salmon, peregrine falcon, western gray squirrel, and bald eagle. Recognizing that the land and waters in our watershed have become impaired and degraded by human activities, the Chambers-Clover Creek Watershed Council (CCWC) has made it its mission to promote the protection and enhancement of the Chambers-Clover Creek Watershed. Members of the CCWC are dedicated to reducing pollution in the area through implementation of the Chambers-Clover Creek Watershed Nonpoint Source Action Plan, improving fish habitat, and fostering a sense of stewardship among watershed residents. Local governments, tribes, businesses, elected officials, resource agencies, non-profit groups, and private citizens are represented in the Council's membership. Pierce County Public Works and Utilities, Water Programs Division, provides staff support for the CCWC.

The Chambers-Clover Creek Watershed Council is guided by their mission statement, as well as a compelling vision of a healthy watershed for the future. This two-year Annual Report outlines the actions taken by the CCWC during 2005 and 2006 in pursuit of a healthier environment and community.



## *Regular CCWC Business*

Members of the Chambers-Clover Creek Watershed Council understand the importance of working together to communicate information on important issues, share successes and challenges, and build support for addressing problems in the watershed.

### Accomplishments in 2005-2006:

- ✓ Meetings – Regular monthly CCWC meetings continue to be held the second Wednesday of every month at Lakewood City Hall, from 3:30 to 5:30 p.m. The public is always welcome to attend. For more information about our past and future meetings, please visit our website at [www.piercecountywa.org/ccwc](http://www.piercecountywa.org/ccwc).
- ✓ Work Planning – A new work planning process helped to guide our efforts during 2006. Annual work plans developed in future years will also serve as a way to track our progress and success. Current work plans are posted on the CCWC website.
- ✓ Executive Committee – The Executive Committee, composed of officers and the Director of Research, meets quarterly to guide watershed council efforts, and develop draft work products, such as the Action Agenda and annual work plans.

Planned for 2007: 2007-2011 Action Agenda; expand attendance at regular meetings

## Maintain and Retrofit Existing Stormwater Facilities

Many stormwater management facilities have been constructed in our watershed over the past 20 years. Maintenance of these facilities is critical to ensure they continue to benefit water quality and operate effectively over their useful life.

### Accomplishments in 2005-2006:

- ✓ Completed construction of industrial storm water treatment facility and fuel tanker truck purging station at Fort Lewis
- ✓ Installation of storm filters on Fort Lewis to treat stormwater discharge to Murray Creek
- ✓ Inspection and maintenance of stormwater lines, vaults, and ponds – Cities of Tacoma, Lakewood, and other local jurisdictions
- ✓ Lakewood stormfilter retrofit – Replaced leaf litter compost system with filter cartridge technology near Lake Louise

Planned for 2007: Pierce County stormwater outfall retrofit at 131<sup>st</sup> St. E and SR-7 to provide water quality treatment and reconnect natural upland drainage to Clover Creek; Planning for Sprinker Recreation Center parking lot demonstration project

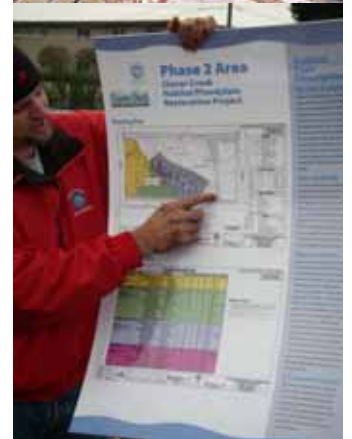


## Restore Streams, Wetlands, and Riparian Areas

Many of the stream banks, wetlands and lakeshores in our watershed have been stripped of their native vegetation. Healthy riparian areas are important to water quality, as they control erosion and sedimentation and filter nutrients from surface water runoff. These areas also provide essential habitat to birds and wildlife, and keep water cool for fish.

### Accomplishments in 2005-2006:

- ✓ Stream Team volunteer planting of Leach Creek near Bridgeport Way (fall 2005)
- ✓ Clover Creek Restoration Project – Pierce County Water Programs initiated Phase 2 of a 12-acre restoration project, including a volunteer planting event in fall 2006
- ✓ Numerous volunteer planting and restoration activities in Puget Creek watershed (Puget Creek Restoration Society)
- ✓ Naches Trail Preserve invasive control – Scot's broom and blackberry control during three volunteer events in 2005-6
- ✓ Formation of partnership between Pierce Conservation District and City of Tacoma to explore feasibility of Flett Wetland restoration



Planned for 2007: Identify priority stream reaches in need of restoration activities, with a focus on stream-side revegetation; sponsor fall 2007 CCWC planting event; completion of Clover Creek Restoration Project Phase 2 (PCWP); Pierce County construction of South Midland Wetland Reserve restoration project

## *Enhance Understanding of Ground and Surface Water Interactions*

At present there is no universally accepted understanding of how the Chambers-Clover Creek Watershed hydrology functioned under natural conditions. An understanding of the interaction between ground and surface water will assure a more enlightened approach to watershed management.

### Accomplishments in 2005-2006:

- ✓ Series of presentations by Don Russell, Director of Research, during CCWC meetings (“Understanding Our Watershed”)
- ✓ Participation in United States Geological Survey (USGS) Chambers-Clover Creek Watershed (WRIA 12) Ground and Surface Water Characterization and Modeling Project (see website at [www.wa.water.usgs.gov/projects/clovercreek/](http://www.wa.water.usgs.gov/projects/clovercreek/))
- ✓ Long-Term Ground Water Monitoring Program – Tacoma-Pierce County Health Department continued to monitor water quality, water level, and production data throughout the watershed.

Planned for 2007: Continue participation in USGS Chambers-Clover Creek watershed project; Pierce County Water Programs Division’s *State of the Watershed* conference scheduled for Oct. 5-6, 2007

## *Review Existing Regulations and Monitor Enforcement*

Local governments have regulations to address water resources in the watershed, but non-compliance without enforcement may negatively impact fish and water quality and quantity. The CCWC is committed to reviewing these regulations and enforcement issues, and making recommendations for implementation in Pierce County and watershed cities such as Tacoma and Lakewood.

### Accomplishments in 2005-2006:

- ✓ Educated Watershed Council on wetland regulations and enforcement in Pierce County and watershed cities
- ✓ Initiated evaluation of Pierce County’s enforcement of codes for protecting wetlands, streams and buffers

Planned for 2007: Complete draft report and make recommendations to Pierce County Planning and Land Services; review City of Tacoma tree-cutting regulations

## *Restore Beneficial Uses of Lakes*

Lakes provide important habitat for fish and wildlife, as well as recreational and aesthetic opportunities for people. By working to protect water quality in our lakes, we work to ensure that the beneficial uses of lakes are protected. Lakes in the watershed include American, Spanaway, Steilacoom, Gravelly, Wapato, Louise, and Waughop lakes.

### Accomplishments in 2005-2006:

- ✓ TPCHD monitored algae blooms and issued toxic algae advisories for Spanaway, Steilacoom,

- Wapato and Waughop lakes in 2005, and for these four lakes plus Lake Louise in 2006.
- ✓ TPCHD monitored water quality for indicators of harmful pathogens at American Lake North Park, American Lake Harry Todd Park, Spanaway Lake Main Beach, and Spanaway Lake North Beach in 2006, and for these four beaches plus Wapato Lake in 2005.
- ✓ Stream Team lake monitoring – Worked with volunteers to track lake levels and water quality



## *Promote Education, Outreach and Public Involvement*

A strong education and outreach program is key to increasing public awareness of and involvement in watershed issues. The CCWC is committed to educating decision-makers and residents in the Chambers-Clover Creek Watershed about the state of our watershed's health and what can be done to restore natural functions, improve water quality, and benefit fish and wildlife.

### Accomplishments in 2005-2006:

- ✓ NatureFest – The annual event, held at the State Game Refuge in Lakewood, was co-sponsored by the CCWC and included a booth featuring CCWC activities.
- ✓ CCWC Watershed tour – Tour sites in September 2006 included a City of Lakewood Stormfilter at Lake Louise, Steilacoom Lake, Waughop Lake, Puget Creek, and the Leach Creek fish passage (culvert replacement) project site at Bridgeport Way
- ✓ Fort Lewis water conservation outreach, including news articles and resident bulletins

Planned for 2007: Sponsor watershed tours in both Spring and Fall; promote 2007-2011 Action Agenda; partner with local schools to teach kids about watershed issues

## *Support Local And Regional Salmon Recovery Efforts in WRIA 12*

Salmon are an important cultural icon, both within the Chambers-Clover Creek Watershed and throughout the Pacific Northwest. Salmon are also a key indicator species, reflecting general watershed health. Unfortunately, Chinook salmon and steelhead are listed as “threatened” under the Endangered Species Act. By taking action to improve conditions for fish, we also benefit the people of our watershed.

### Accomplishments in 2005-2006:

- ✓ Watershed Council participation on Pierce County Lead Entity citizen's advisory committee for salmon recovery

- ✓ Salmon Recovery Funding Board (SRFB) 6<sup>th</sup> and 7<sup>th</sup> round processes; project tours and submittals for two Water Resource Inventory Area (WRIA) 12 projects
- ✓ Initiated nearshore assessment of WRIA 11/12 shoreline between Nisqually River and Point Defiance to identify potential restoration projects likely to benefit salmon (South Puget Sound Salmon Enhancement Group)
- ✓ Leach Creek box culvert replacement project constructed in summer-fall 2005 (University Place and Lakewood)

Planned for 2007: Participate in Salmon Recovery Funding Board 8<sup>th</sup> Round process, as well as Puget Sound Partnership grant process

## *Monitor the Watershed and Report Results*

Monitoring of water quality, aquatic biota, and habitat helps us improve the success of our efforts over time by establishing baseline conditions, detecting problems, and identifying trends. When watershed indicators are carefully tracked, CCWC and other actions can be assessed for effectiveness and benefits, and revised as needed to achieve our goals for a healthier watershed.

### Accomplishments in 2005-2006:

- ✓ Flett Creek monitoring – Students in the Environmental Sciences and Technology program at Clover Park Technical College continue to monitor water quality and fish and wildlife habitat
- ✓ Pierce County Water Programs monitors aquatic insect populations (as a measure of stream health) in Spanaway and Clover creeks, and stream flows in numerous creeks
- ✓ McChord AFB monitors water quality in Morey and Clover creeks
- ✓ Washington Department of Fish and Wildlife monitors salmon returns at Chambers Bay
- ✓ United States Geological Survey monitors stream flows in North Fork Clover, Clover, Flett, Leach, and Chambers creeks

Planned for 2007: Monitoring is ongoing in 2007 by all agencies and organizations noted above; select summary data is presented in the report card included in this CCWC 2005-2006 report

The Chambers-Clover Creek Watershed Report Card is a snapshot of the health of the our watershed during 2005-2006 (see page 6). The data reflected in the report card were collected by a number of agencies throughout the watershed and include information on:

Water Quality - The Water Quality Index integrates several parameters into a single score (1 to 100) for easy comparison across time and similar bodies of water.

Water Quantity - Precipitation and land use patterns in our watershed affect instream flow, which is related to the survival of many species of fish and wildlife. Flooding (too much flow) is also problematic.

Lakes - Water quality is measured in terms of visibility (Secchi Depth), algae (Chlorophyll a), and nutrient loading (Total Phosphorus).

Groundwater - Groundwater health is particularly important to the drinking water supply in the watershed.

Aquatic Insects - The Benthic Index of Biotic Integrity (B-IBI) is a tool used to measure the diversity and abundance of bottom-dwelling bugs living in streams, as indicators of stream health.

Salmon - The Salmonid Stock Inventory (SASI) assesses each stock's status from "healthy" to "extinct" and is used to prioritize recovery efforts under the federal Endangered Species Act. Note that salmon "returns" are closely tied to the number of fish released from hatcheries.

We hope you will find it useful, now and in years to come.

## Chambers-Clover Creek Watershed Report Card 2005-2006

**Water Quality:** Fish populations require good water quality, high dissolved oxygen, and low peak temperatures.

	Water Quality Index		Dissolved Oxygen (mg/L)		Peak Summer Temp. (°C)	
	Value	Status	Value	Status	Value	Status
Spanaway Creek	85	Good	10.6	Extraordinary	N/A	N/A
Chambers Creek	88	Good	9.7	Extraordinary	20.2	Good
Puget Creek	82	Good	10.8	Extraordinary	12.5	Extraordinary
Clover Creek	56	Fair	7.7	Good	22.5	Poor
Morey Creek	N/A	N/A	9.0	Excellent	18.3	Good
Flett Creek	16	Very Poor	6.4	Fair	N/A	N/A

**Water Quantity:** Stream flow throughout the watershed is influenced by annual rainfall.

	Low Flow (ft <sup>3</sup> /s)		High Flow (ft <sup>3</sup> /s)		Notes
	2005	2006	2005	2006	
Clover Creek @ 138th	0.3	0.1	11	11	Peak flows for 2006 occurred November 7, during the Election Day flood event. Total precipitation for 2005 was 32 inches. Total precipitation for 2006 was 40 inches. Historically, annual precipitation averages 37 inches.
Clover Creek @ 25th	4	5	20	173	
Spanaway Creek	0.0	0.0	24	50	
Chambers Creek	29	31	209	468	
Flett Creek	0.0	0.2	75	89	
Leach Creek	5	7	68	79	

**Lakes:** Values given for Secchi depth, chlorophyll a, and total phosphorus reflect the mean value and range ( $\mu$ , range).

	Secchi Depth (m)		Chlorophyll a ( $\mu$ g/L)		Total Phosphorus ( $\mu$ g/L)	
	2005	2006	2005	2006	2005	2006
American Lake	6.9, (5.0-9.1)	6.4, (4.5-8.1)	2.8, (<1-7)	2.5, (<2-6)	20, (<10-50)	37, (<10-130)
Lake Steilacoom	3.7, (2.0-5.5)	3.8, (6.0-2.5)	11.6, (3-30)	9.1, (<2-20)	33, (10-70)	34, (20-60)
Gravelly Lake	6.1, (3.0-7.2)	8.0, (5.5-9.7)	6.5, (<2-21)	2.3, (<2-5)	16, (<10-40)	25, (<10-70)

**Groundwater:** Groundwater levels in wells are measured in feet below ground.

	2003		2004		1996-2002	Well Depth
	Median	Range	Median	Range	Range	
ACN740	120	38-159	50	33-74	15-94	Shallow
AAB148	23	23-32	28	22-32	16-36	Shallow
ACN730	161	139-189	157	145-175	132-187	Sea Level
ACY127	255	201-313	255	200-317	132-313	Deep

**Aquatic Insects:** As measured by the Benthic Index of Biotic Integrity (B-IBI), aquatic insects reflect stream health.

	Avg. Score	5-year Range	Status	Notes
Chambers Creek	23	20-28	Poor	Data shows no trend of habitat improvement or degradation over five consecutive years (2000-2005) of monitoring.
Clover Creek	22	20-26	Poor	

**Salmon:** Returns to Garrison Spring Hatchery, on Chambers Creek, are measured by WDFW.

	Chum	Chinook	Coho	Steelhead	Notes
1980	2,239	35	1,931	N/A	Chinook and Coho are managed primarily for harvest purposes, Chum are managed for conservation. No hatchery program currently exists for steelhead.
1990	1,744	N/A	1,641	N/A	
2004-5	2,743	1,658	1,058	N/A	
2005-6	1,154	1,432	379	N/A	

***Current Active members of the Watershed Council include:***

Pierce County  
Pierce Conservation District  
Tacoma-Pierce County Health Department  
Washington Dept. of Ecology  
Washington Dept. of Fish & Wildlife  
U.S. Geological Survey  
City of Tacoma  
City of Lakewood  
City of University Place  
City of Fircrest  
City of Dupont  
Town of Steilacoom  
Town of Ruston

Puyallup Tribe of Indians  
Cascade Land Conservancy  
Citizens for a Healthy Bay  
Puget Creek Restoration Society  
South Puget Sound Salmon Enhancement Group  
Leach Creek Watershed Stewards  
Clover Creek Council  
Fort Lewis  
McChord Air Force Base  
Master Builders  
Trout Unlimited

***...and many dedicated citizens!***

*For more information about the Chambers-Clover Watershed Council, or to find out how you can get involved, please contact Lorin Reinelt, Pierce County Watershed Coordinator, at (253)798-3096, or visit our website at [www.piercecountywa.org/ccwc](http://www.piercecountywa.org/ccwc). The watershed council meets the second Wednesday of every month at Lakewood City Hall, from 3:30 to 5:30 p.m. We hope you'll join us!*

Al Schmauder, Citizen  
Chair

Greg Vigoren, City of Lakewood  
Vice-Chair

Ione Clagett, Citizen  
Secretary

Don Russell, Citizen  
Director of Research

Karen Zirkle, Citizen  
Director of Fish & Wildlife

Cindy Beckett, Citizen  
Director of Wetlands



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