

## The City of Bellingham's Actions to Improve the Water Quality of Lake Whatcom: A Chronology



February 25, 2009

## Background:

Lake Whatcom is the water source for all 75,000 residents of the City of Bellingham, and provides water to another 25,000 residents in Whatcom County. Unfortunately, the water quality of the Lake has been declining steadily in recent decades. Since 1998, the Lake has been listed as an Impaired Water Body for dissolved oxygen under the standards of the Clean Water Act. In 2004, the Washington State Department of Ecology (DoE) listed the Lake as impaired from high levels of phosphorous, dieldrin, mercury, and PCBs. Pollution, particularly phosphorus pollution that leads to algal blooms and impaired oxygen, is also leading to the adoption of a strict regimen for pollution control under the Department of Ecology's Total Maximum Daily Load (TMDL) process.

At the same time, actions have been ongoing by the City of Bellingham and other jurisdictions to control pollution of the Lake. These actions include efforts to preserve the health of the remaining forest ecosystem around the Lake, reduce the rate of new development in the watershed, and require best practices for low-impact development and stormwater treatment and infiltration.

This report documents major actions taken by the City of Bellingham to protect its water source, and, where available, corresponding trends and indicators to measure the effects of various protective measures. Highlights are summarized below.

## Highlights:

- The number of acres of land protected by purchase (City plus County), conservation easements, and other agreements stands at 1,449 acres since 2001. (The total land area in the watershed is 31,127 acres).
- The City has adopted stricter regulations for land use in the watershed, including restrictions on impervious surfaces, and strengthened protection of streams, wetlands, and steep slopes.
- In 1985 there were approximately 2,000 homes in the watershed. As of 2006 there were 6,492 housing units in the watershed.
- The number of parcels being developed in the watershed averaged 232 per year over the 2005–07 period. The number of parcels developed each year has trended downward.
- The proportion of watershed parcels being developed that are in the City of Bellingham has dropped from seven percent in 2005 to two percent in 2007.
- The City has completed more than 20 storm water control projects within its portion of the watershed. However, studies to date indicate that some of these projects are not effective in controlling phosphorus. The City continues to refine these projects to improve phosphorus control.

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## Section 1: Land Preservation

Land preservation measures focus on retaining land in a relatively undeveloped state to enhance preservation of natural habitat and forest cover. This includes protection of the Lake Whatcom landscape through the use of preservation management agreements with landowners, direct protection of land via purchase, and creation of conservation easements to restrict potentially damaging activities on specific parcels. Measures to keep land in an undeveloped state are the first line of defense in sustaining ecosystem integrity. Measures to control pollution from land that is already developed, or being developed, represent a second-best method to reduce the impact of human activities on lake water quality. These include land use regulations, control of stormwater runoff on developed land, and wetland and stream protection efforts. These are taken up in subsequent sections of this paper.

### 1. a. Land Preservation Management

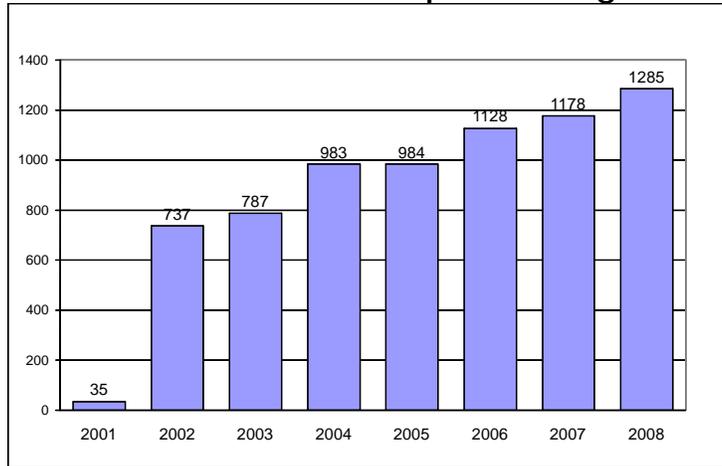
The City has supported land use practices in the watershed that strengthen protection of the Lake. One critical activity in this area is the regulation of forestry practices to reduce the risk of landslides and accelerated soil erosion, and consequent phosphorus transmission into the Lake. The most extensive activity in this area is the effort by the City, Whatcom County, and others to require the Department of Natural Resources (DNR), which is the largest landholder in the watershed, to abide by strict standards when it harvests timber or builds roads. These efforts led to the adoption of the Lake Whatcom Landscape Management Plan, which binds DNR to stricter standards for harvesting and road building than in other lands regulated by the state agency. More recently, the City supported ongoing County efforts to gain control, through a "reconveyance" process, of approximately 8000 acres of DNR watershed lands. Highlights of Activities Include:

- **1989 forward.** To realize the forest practices goals of the Lake Whatcom Watershed Management Program, the City supported and participated on the Lake Whatcom Forestry Advisory Forum since its formation in 1989.
- **2000.** The City became a member of the DNR Landscape Planning Committee and participated in developing the Lake Whatcom Landscape Plan.
- **2004.** In October 2004, the City joined with Whatcom County and the Lake Whatcom Water District to file a lawsuit against DNR to force it to implement the Lake Whatcom Landscape Plan. The plan, now adopted by the DNR Forest Practices Board, requires that timber harvesting and road building in the 15,700 acres currently managed by DNR adhere to high standards for stream protection, and prevents logging on unstable slopes.
- **2008.** Whatcom County, with City support, began a process to gain control of about 8000 acres of DNR lands in the watershed for low-impact parks.

## 1. b. Land Acquisition

In 2001 Bellingham began a program to purchase land in the Lake Whatcom watershed, financed by monthly charges to residents and businesses receiving city water. Purchased land is managed to minimize soil erosion and lake pollution. Properties prioritized for purchase are those at the highest risk for being developed, have steep slopes at risk of sliding, or are closest to the Lake. Other properties may be purchased if they are appropriate for water treatment or infiltration facilities.

**Chart 1: Cumulative Lake Whatcom Acreage Purchased Via Land Acquisition Program**



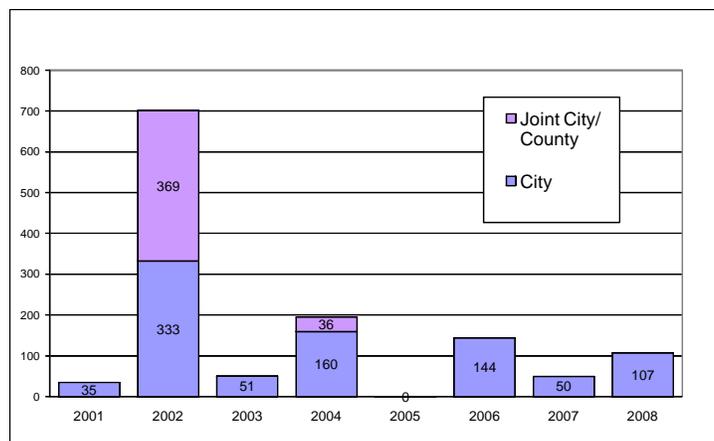
Source: City of Bellingham Land Acquisition Program.  
Note: 405 acres are joint city/county purchase

From 2001 through 2008, the City purchased 880 acres individually, and 405 acres in conjunction with Whatcom County, for a total of 1,285 acres. The rate of acquisition fluctuates depending on the resources available in the acquisition fund, and the availability of properties. Revenues from the acquisition fee back interdepartmental loans or bonds that allow purchase of available parcels. The City has also worked with the Lake Whatcom Water and Sewer District, and the Sudden Valley Neighborhood Association, to acquire undeveloped lots in Sudden Valley, often through tax foreclosures. Additional watershed properties are protected via conservation easements rather than outright purchase.

Highlights of the acquisition program include the following.

- **2000.** Bellingham passed the Watershed Land Acquisition Fee Ordinance providing funding for acquisition of land for preservation (Ordinance 2000-09-058). The ordinance also created a Watershed Advisory Board to advise on acquisitions.
- **2002.** Joint purchase (with County) of 369 acres of harvestable timberland.

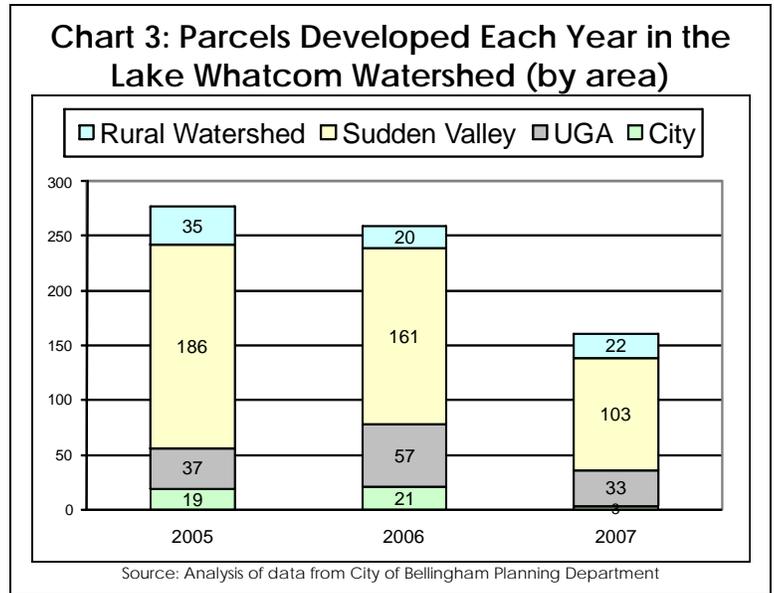
**Chart 2: Lake Whatcom Acres Purchased Per Year (City, and joint City/County Purchases)**



Source: City of Bellingham Land Acquisition Program.

*Highlights, continued:*

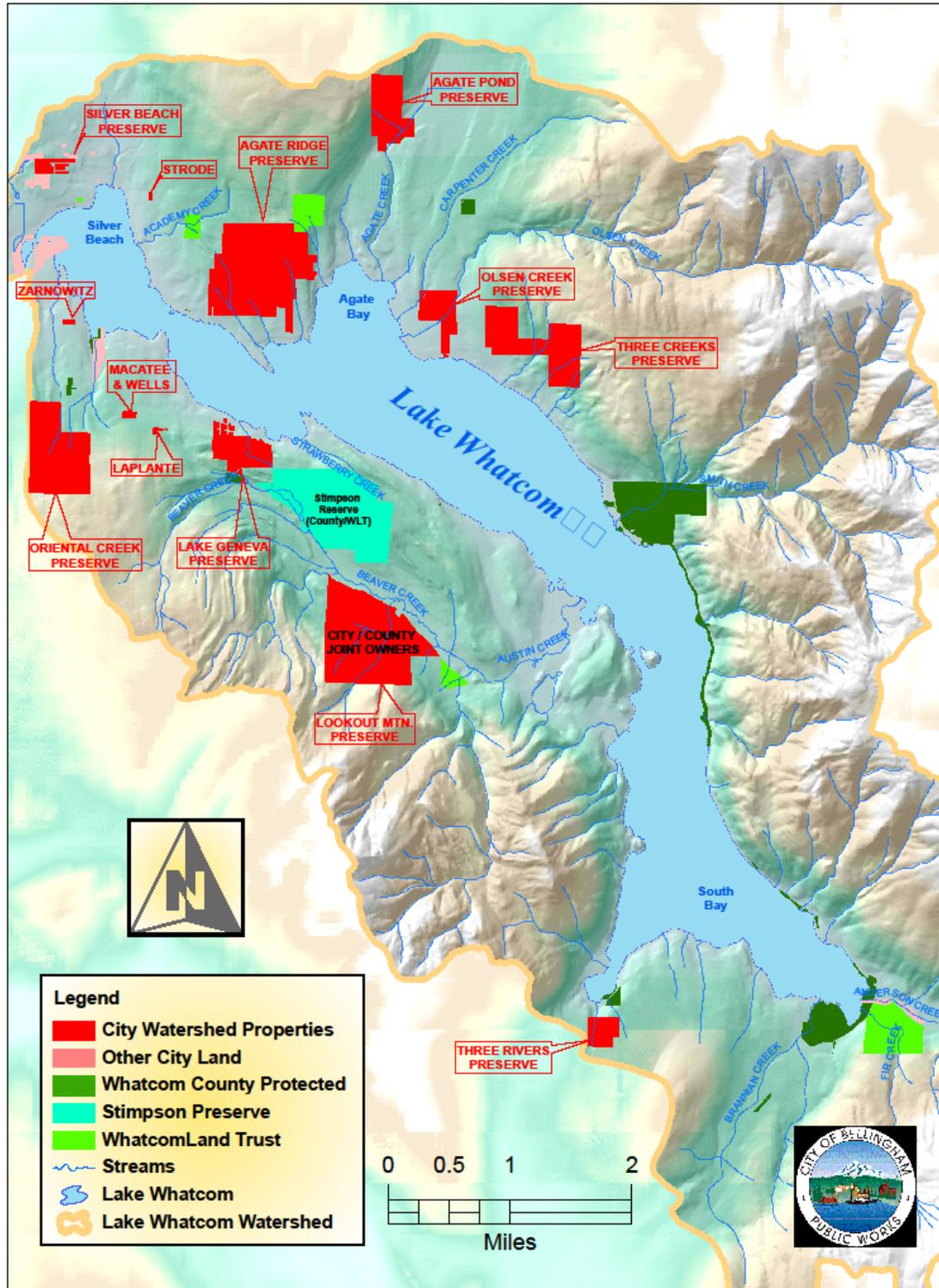
- 2002. The City purchased a 40 acre lot in the Geneva area platted for a 91-lot subdivision.
- 2002. 199 acres with 40 potential residential units near Agate Bay purchased from Trillium company.
- 2003. 40 acres with potential for timber harvest acquired.
- 2004. 160 acres with vested development rights for 241 housing units purchased.
- 2004. Purchase of 160 acres in Geneva (planned for a 241 lot subdivision).
- 2006. Purchase of 132 acre parcel near Agate Bay.
- 2006. The city worked to reduce potential density in Sudden Valley, in conjunction with Sudden Valley and the Lake Whatcom Water and Sewer District. Many of the parcels were protected through tax foreclosure and tax title. (See Table 1 for details through 2006).
- 2001-2008. As of the end of 2008, the City has purchased 1,285 acres at a cost of over \$18.5 million dollars.
- 2001-2008. The City, via donation, purchase, or joint purchase with Whatcom County and the Water and Sewer District, has helped protect an additional 164 acres of watershed land through conservation easements. Purchases plus easements total of 1,449 protected acres.
- 2005-2007. The number of acres developed each year, while still high, has trended down each year in the 2005-07 period (Chart 3). During this period, the proportion of all developed parcels that were in the City of Bellingham dropped from seven percent in 2005 to two percent in 2007.<sup>1</sup>
- 2008. The City purchased an additional 107 acres of land.



**Table 1: Sudden Valley Community Association Density Reduction Program as of Spring 2006**

SVCA Owned Lots with Permanent Restrictive Covenants	709
Lot Consolidations*	586
SVCA Owned Lots without available ULID 18 Assessment	46
<b>Total Density Reduction</b>	<b>1341</b>
Vacant Lots** (Including Restrictive Covenants)	980
* 266 Irrevocable Covenants; 320 Lot Line Erasures	
** SVCA Estimate	

Figure 1: Lake Whatcom Land Acquisitions as of December 2008



N:\arshared\watersjed\GIS acqu projects\current map projects\WATERSHED LBLD W TOPO 1-5-09 UPDATED ACQUISITIONS

Source: City of Bellingham Public Works

## Section 2: Land Use Regulations

While outright protection of the land via ownership or conservation agreements is the most effective way to minimize soil erosion and ecosystem degradation in the watershed, regulations to ensure that development occurs in ways that minimize impacts on the land are also necessary. Such measures include protective ordinances requiring buffers around streams and wetlands. In addition, the City has developed specific land use rules providing for more stringent regulation near the lake than is the case outside the watershed.

### 2. a. Shoreline and Land Protection

The City has adopted a number of land use and development rules to broadly protect streams, the lake, and the land. Many of these have to do with setting aside corridors to protect fragile ecosystems. Other regulations help to prevent erosion as development proceeds.

Highlights include the following:

- **1989:** The City amended the Shoreline Master Program to require shoreline setback, no hard surfacing or structures within the first 25 feet, and prohibiting the use of treated wood in direct contact with water.
- **1991:** The City adopted a Wetland and Streams Ordinance which required better protection of wetlands and buffers around streams and wetlands.
- **1992:** The City adopted a Clearing Ordinance (Ord. # 10308) which sets standards for land clearing and requires an approved plan for clearing of land for buildings or roads.
- **2001.** The City adopted the Lake Whatcom Regulatory Chapter (referred to as the "Silver Beach Ordinance") that limits impervious surfaces, and places seasonal restrictions on land clearing.

### 2. b. Land Use Rules/Enforcement

The City has adopted a number of development regulations that apply specifically to lands in the watershed. These include rules on the process of subdivision, oversight of development activities, and rules governing development on steep slopes. Some of these rules prohibit substandard size lots. Other efforts focus on education and inspections to ensure compliance with existing land use rules. These include daily inspection of active construction sites and weekly inspection of lots during periods when clearing is restricted.

In addition, the City opposed the addition of Sudden Valley to its urban growth area to restrict development potential of that area. Another indirect method of restricting development is prohibitions on new water and sewer hookups, a practice adopted in 2003. In addition, in 2007 the City passed legislation prohibiting new septic systems in the City portion of the watershed.

Highlights include the following:

- **1991:** Bellingham denies Water District 10 (later renamed the Lake Whatcom Water and Sewer District) request for additional sewage capacity.
- **1997:** The City adopted a revised Subdivision Code, which prohibits the use of the “one and one half rule” that previously enabled the creation of sub-standard size lots in the watershed. Also in 1997 the city prohibited the use of the “300 foot rule” which also could have allowed the creation of substandard size lots in certain circumstances within the watershed. [BMC 20.30.040]
- **1997.** The land use code was amended to enable the Transfer of Development Rights (TDR) to allow for purchase and transfer of vested development rights from the watershed and environmentally sensitive areas to other parts of the City’s urban growth area. (However, this ordinance has not resulted in protection of any parcels to date, and is under review for possible revision).
- **1998:** Bellingham denies a Water District Number 10 request for water capacity for a 95 lot subdivision.
- **2001:** The City adopted the new Department of Ecology Best Available Science Manual, which includes new standards for low impact development.
- **2003:** In an effort to discourage development, the City adopted a moratorium on water and sewer main extensions in the watershed, unless the extension resulted in a reduction of density in the watershed.
- **2003:** The City extended sewer and water to the Britton Circle Subdivision in the UGA but reduced the total number of lots from 36 to 18 which resulted in an open space tract.
- **2005.** The City voted to oppose the addition of Sudden Valley as a provisional urban growth area for Bellingham, and the incorporation of Sudden Valley as a City (Resolution 2005-18). In 2006 the urban growth area designation for Sudden Valley was rescinded by Whatcom County.
- **2008.** In May 2008, the city placed a 4-month moratorium on subdivisions and building permits in the city portion of the Lake Whatcom watershed to allow the Planning Department time to respond to requirements of the Department of Ecology’s TMDL process.
- **2008.** The City extended the moratorium to prohibit land disturbance activity greater than 500 square feet and then in September extended the entire moratorium for six months, to expire in March 2009.

## Section 3: Stormwater Treatment and Management

Stormwater management requires a wide array of activities, facilities, and ongoing investment to reduce the contribution of rainwater runoff to phosphorus pollution in the Lake. One of the most effective ways of reducing phosphorus and other pollutants is for runoff from the land to be filtered by soil before it enters groundwater. This binds nutrients such as phosphorus that would otherwise be at risk of entering the lake or other water bodies. Numerous City projects have been completed to treat stormwater via retention and infiltration.

It is important to note, however, that controlling phosphorus runoff into watersheds is an emerging science. Results from some early stormwater projects that were not designed to specifically limit phosphorus, show poor performance. Many of those systems are in the process now of being modified to enhance phosphorus removal. Even with improvement, though, the best stormwater mitigation available falls short of replicating the natural processes of an undisturbed forested system.

Highlights of activities include:

- **1990:** Bellingham enacted a Watershed Stormwater Ordinance requiring erosion controls for single family development, and water quality systems for all land disturbing activities (Ordinance 10023).
- **1992:** The first regional stormwater quality treatment system is built at Barkley Boulevard and Britton Road.
- **1995:** The City adopted a new Stormwater Ordinance requiring Best Management Practices (BMP) including site plans, efforts to reduce soil movement and runoff, and streambank and wetlands protections for construction and other land-disturbing activities.
- **1995:** Bellingham acquired land and developed the Park Place Stormwater facility as a first effort at stormwater retrofitting of existing development.
- **1995:** The City declared Lake Whatcom to be a "Water Quality Sensitive Area" (Ordinance 10633). (This later resulted in a requirement to provide nutrient controls when the Lake was listed by the State Department of Ecology as impaired for dissolved oxygen in 1998.)
- **1998:** The City declined street right-of-way vacation petitions (i.e. E. Indiana St.) to preserve undeveloped rights-of-way for stormwater management purposes.
- **2000:** The City retrofitted the Sylvan Estates subdivision with water quality controls at a cost of approximately \$50,000.
- **2001:** The City adopted the Silver Beach Ordinance limiting permitted uses, impervious area lot coverage, and defining the season for earthwork.
- **2001:** Bellingham passed a monthly stormwater fee structure to provide a dependable source of revenue for stormwater projects including Lake Whatcom.

- **2002:** The City retrofitted a portion of Electric Avenue for water quality in conjunction with installation of pedestrian facilities at a cost of approximately \$20,000.
- **2003:** The Bloedel Donovan Parking lot, Alabama Street, and a portion of Electric Ave. were retrofitted at a cost of approximately \$190,000. This retrofit treats approximately 19 acres of roadways and developed property. This is the first of a multi-year plan to retrofit all stormwater outfalls within the city limits.
- **2004:** The City retrofitted the stormwater system at Northshore and E. Connecticut at a cost of approximately \$177,000. This retrofit treats about 26 acres of roadways and developed property.
- **2004:** (and forward) the City hires additional labor during the Watershed building window to oversee construction controls. The target is to visit each watershed construction project once per day.
- **2004:** Dry weather monitoring of stormwater outfalls within Lake Whatcom was completed. Work included visual monitoring and water testing for fecal coliform, dissolved oxygen, turbidity, temperature, phosphorus and pH. Results to date show two point source fecal problems along with evidence of problems associated with pet/animal waste.
- **2005:** Park Place Water facility is remodeled to become a sand filter to improve the phosphorus removal efficiency of the facility.
- **2005:** A stormwater facility is constructed at Donald Avenue for phosphorus removal. As part of project a large source of phosphorus from household grass dumping is found. Project removed tons of material that were transmitting phosphorus to the lake.
- **2005-06:** City conducts study of alumina activated filtration of phosphorus.
- **2006:** The City did an analysis of its street sweeping program for phosphorous control on roads in the watershed and found that increased sweeping in the watershed reduced phosphorus transmission. The city increased sweeping as a result.
- **2006:** The stormwater code was updated with Ordinance No. 2006-05-047, which promotes and facilitates the use of Low Impact Development (LID) for stormwater management. It also includes adoption of latest DOE standards for phosphorus treatment systems and special stormwater standards for Lake Whatcom. All projects requiring a building permit of disturbing more than 500 sf of soil must meet special requirements.

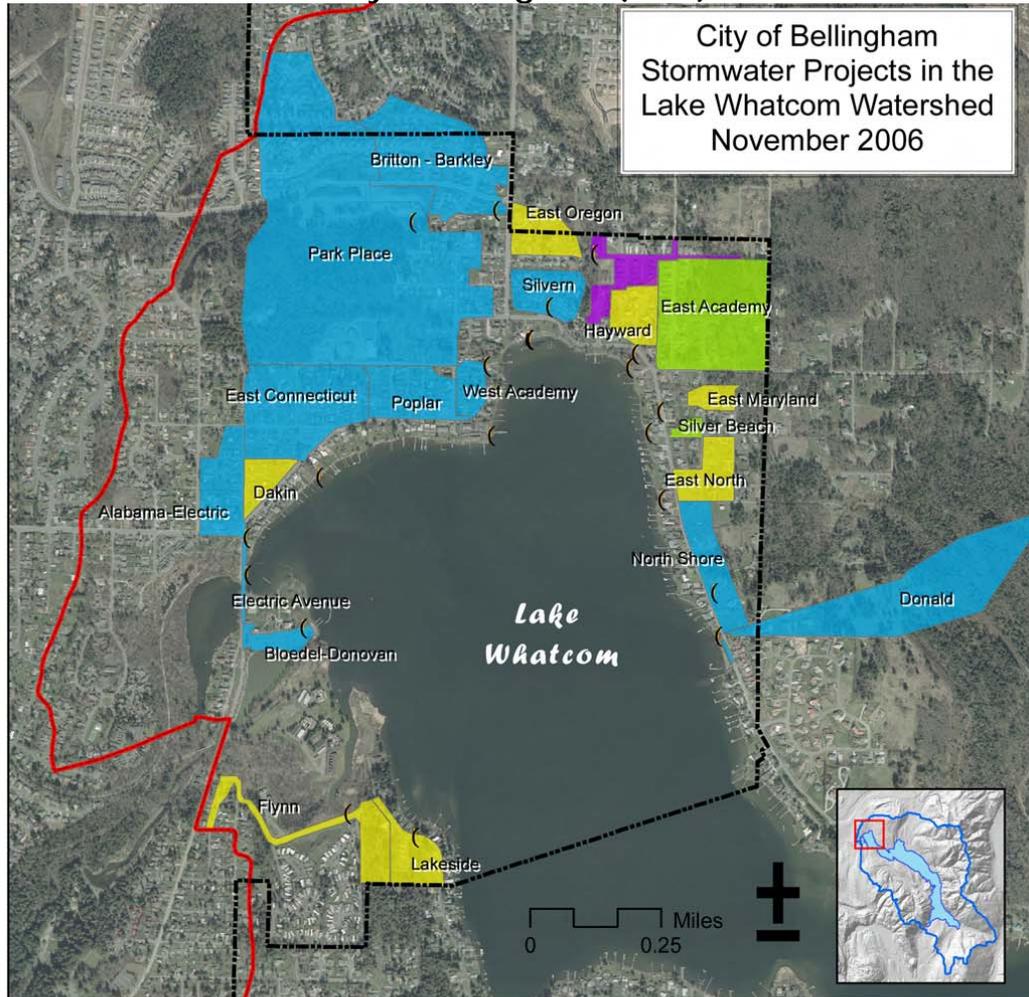
### Stormwater Facts

- ❖ As of 2006 Bellingham was conducting stormwater management on approximately 290 acres out of its total of 635 watershed acres.
- ❖ The City sweeps arterials and side streets in the City's portion of the watershed three to four times a month and mows roadside vegetation three times per year to assist with ditch maintenance. Sand is swept from the roads within one week of the end of icy conditions.
- ❖ Silver Beach Creek and Hillsdale Creek, in city limits, are the 3<sup>rd</sup> and 4<sup>th</sup> largest contributors to phosphorus in the Lake despite each representing less than 2% of the watershed area.†

† Parametrix, *City of Bellingham Lake Whatcom Stormwater Management Program*, 2007

- **2006:** Stormwater projects completed include E. Academy Water Quality Facility and E. Silver Beach Water Quality Facility.
- **2007:** The City completed a draft comprehensive stormwater plan for phosphorus control. This will be coordinated with Whatcom County.
- **2007:** The City implemented a private-residential stormwater treatment pilot program for at least five properties in the Silver Beach portion of the watershed.
- **2007:** City installs treatment systems at E. North Street, E. Oregon east of Britton.
- **2007:** City of Bellingham installs the first Filterra stormwater system in the State of Washington. System uses a combination of media filtration with plant uptake. System under study for performance.
- **2007:** City installs alumina filter at Pullman Street as next phase in study of new media for phosphorus removal.
- **2008:** City constructs a sand filter near Northridge Drive to treat phosphorus for approximately 27 acres including a portion of Tweed Twenty in the county.
- **2008:** City studies new proprietary media material designed to target dissolved phosphorus.
- **2008:** The City received a Stormwater Grant from the DoE to assist private homeowners in installing rain barrels on private property and to educate homeowners on the designs of other stormwater best management practices.
- **2008:** The city utilized pervious pavement and added large sand filter for stormwater filtration and infiltration as part of improvements on Northshore Drive between Alabama and Britton road.
- **2008:** New stormwater code is being written to support modification to the Lake Whatcom Regulatory Chapter and the Lake Whatcom TMDL.

Figure 2: Map and List of Lake Whatcom Stormwater Projects in the City of Bellingham (2006)



**Legend**

- City Limits
- Watershed Boundary
- Stormwater Facilities
- Existing Treatment Area
- Recent Treatment Area
- Future Treatment Area
- Private Treatment Area



City of Bellingham Lake Whatcom Watershed Stormwater Projects				
	Construction Year	Description	Area (acres)	Cost
Past Projects	1992	Britton & Barkley	N/A	\$48,000
	1994	Park Place	117.47	\$286,000
	2000	Silver Lane	6.34	\$30,000
	2002	Electric Avenue, Alabama to Bloedel	0.8	\$189,640
	2003	Bloedel Donovan/Alabama Street	18.9	\$198,082
	2004	E. Connecticut Outfall	25.8	\$150,535
	2005	Park Place Water Quality Facility	N/A	\$60,000
	2005	Poplar Drive	8.6	\$120,000
	2005	W. Academy Street	2.05	\$30,000
	2005	Donald Ave	28	\$30,000
Current Projects	2005	North Shore Swales	3.5	\$50,000
	2006	E. Academy Street	29	\$120,000
	2006	Silver Beach Avenue	6	\$25,000
Future Projects	2007	E. Oregon Street	6.56	\$50,000
	2007	Flynn Street	10	\$50,000
	2007	Brentwood Retrofit	TBD	\$330,000
	2008	E. Maryland Street	2.62	\$100,000
	2008	E. North Street	9	\$100,000
	2008	Hayward Avenue	8.2	\$100,000
	2008	Lakeside	6.88	TBD
<b>TOTAL:</b>			<b>289.72</b>	<b>\$2,067,257</b>

Source: City of Bellingham Lake Whatcom Stormwater Management Program: Evaluation of Stormwater Phosphorus and Recommended Management Options, October 2007

## Section 4: Community Outreach and Education

Educating the general public, and residents, business owners, and employees who live or work around the Lake, is another critical element of improving the water quality of Lake Whatcom. Property owners are more likely to reduce the impacts of their activities if they have the best available information to do so. A Lake Whatcom website provides a clearinghouse for information that citizens can use to help reduce the impacts of their actions on the Lake. Interested landowners can participate in a Stewardship program for their property with assistance from City staff. City employees also conduct environmental education about the Lake at local elementary schools.

- **1993 forward:** The City's Sharing Our Watershed program organized by the Environmental Education staff reaches over 1000 5<sup>th</sup> grade students and their teachers a year. In a new component of the program, students are tasked with building their own city, which includes incorporating the Lake Whatcom water system.
- **1998:** The City partnered with the Washington State Department of Ecology and RE Sources to launch the first Whatcom Watershed Pledge in the Lake Whatcom and Whatcom Creek Watersheds. The Pledge was funded through an EPA grant and it targeted 12,000 households. The pilot program earned a Special Recognition Award from Governor Gary Locke. The program has been replicated in every other city watershed and many in the county.
- **1999:** The City helped set up the Lake Whatcom website ([www.lakewhatcom.wsu.edu](http://www.lakewhatcom.wsu.edu)) which includes information on the Lake Whatcom Management Program, threats to the lake's water quality, and stewardship solutions that lessen the impacts of human activities on the lake. The website also outlines the transportation goals and policies that can enhance Lake Whatcom water quality protection.
- **2001:** The City developed, and made available to the public, an extensive list of native plants for revegetation requirements of the Silver Beach Ordinance.
- **2006:** The City worked with Whatcom County and community volunteers to construct a demonstration garden at Bloedel-Donovan Park.
- **2007:** The Bellingham Public Works and Parks Departments established a stewardship program, in conjunction with Whatcom County, that focuses on personal efforts to protect the watershed, such as washing a car at a commercial car wash rather than on land draining to the lake, or cleaning up dog waste.
- **2007:** The City sponsored segments about Lake Whatcom for BTV10 in order to educate the public about how to "tread lightly" in the watershed.
- **2007:** The City produced and distributed a "Stewards of the Lake" report and brochures educating the public about the lake and needed stewardship actions.

## Section 5: Water Quality Monitoring and Pollution Prevention

Monitoring water quality trends in the Lake provides for a “bottom line” measurement of whether all the activities aimed at protecting the Lake are having the expected results. Other pollution-prevention measures, such as a prohibition of the use of two-cycle boat engines on the Lake, aim to reduce pollution at the source.

### 5. a. Water Quality Monitoring

Efforts to monitor water quality include the following:

- **On-going:** Bellingham has supported, reviewed, and provided analytical assistance for two decades for in-lake water quality monitoring via contract with the Institute for Watershed Studies (IWS) at Western Washington University. The City also contracts for stormwater treatment system monitoring, lake tributary monitoring, water balance and water flow dynamics, and special studies.
- **On-going:** The City continues to operate and maintain weather stations in the watershed which aid in understanding the lake water balance, stormwater inputs, and support modeling efforts in the watershed.
- **2005/2006:** The IWS conducted monthly monitoring of Anderson, Austin, Beaver, Blue Canyon, Brannian, Carpenter, Euclid, Mill Wheel, Olsen, Park Place, Silver Beach, Smith, and Whatcom Creeks. (IWS tributary monitoring was reduced to twice a year post-2006).
- **2006:** The Austin Creek drainage area was selected as the special project for tributary monitoring.
- **2007:** A consultant was hired to expand upon the tributary monitoring program to include baseflow, storm event, and continuous monitoring for phosphorus surrogate development through April 2008. The City supported studies of hydraulic monitoring of significant tributaries in the watershed to derive loading estimates for water quality impact.
- **2004:** In partnership with the State, the City conducted follow-up studies on mercury in fish tissues, water, and sediment. The City conducted a mercury source investigation through contract with the United States Geological Service. This investigation was coordinated with the Department of Ecology’s Lake Whatcom Total Maximum Daily Load (TMDL) study.

## 5. b. Pollution Prevention and Control

This activity involves the control of some of the remaining non-point sources of pollution in the Lake. This includes regulation of polluting boat engines to reduce gas and oil pollution. While many of activities mentioned in prior sections are designed to help control phosphorus transmission from soils and other sources into the Lake, the City also regulates phosphorus directly via a partial ban on the use of phosphorus-containing fertilizer in the watershed. The City has also begun to develop an emergency response plan for large spills that may occur in the Lake.

Highlights include:

- **1993.** A burn ban was adopted (citywide) which reduces the amount of incinerated material entering the Lake and other water bodies.
- **2005.** The City banned two-stroke engines in the City portion of the Lake starting January 2006 except those meeting 2006 or later EPA emissions standards. (10 horsepower or less two-stroke engines had one additional year to comply). [BMC 8.12.135]
- **2005.** The City passed a ban on public and residential use of lawn fertilizers containing phosphorus in the watershed after the first growing season. [Ordinance number 2005-06-044] A similar ordinance was also passed by Whatcom County.
- **2007.** The City contracted with engineering consulting firm CH2M Hill to conduct a spill response exercise for Lake Whatcom.

## Section 6: Transportation

Transportation facilities, particularly roads, contribute to runoff and the transfer of pollutants, including phosphorus, into the lake.<sup>2</sup> The City attempts to reduce the contribution of roads to phosphorus loading by diverting traffic away from the lake whenever possible. The City has also adopted special rules for roads, requiring narrower dimensions and limits on impervious surfaces. Lastly, the City participates in efforts to encourage mass transit or non-motorized travel to reduce the contribution of automobiles to lake pollution.

- **2001:** The City adopted Low Impact Development (LID) Lake Whatcom road standards to limit impervious surface and protect water quality.
- **2002:** Lake Whatcom Road Development standards were adopted, allowing narrower roads to be built in the watershed, and sidewalks on one rather than both sides of the street, in order to reduce impervious surfaces.
- **2006:** A new Comprehensive Plan was adopted, including a Transportation Element section with new goals to minimize impacts to water quality of projects built in the watershed. The Transportation Element incorporates two new goals and nine new policies mainly addressing routing traffic away from the Lake, and reducing Sudden Valley trips. It also calls for the City to work with the Whatcom Transportation Authority (WTA), Whatcom County, and Sudden Valley to improve mass transportation within the watershed, and educate residents on transportation alternatives.
- **2008:** Northshore Drive Road Improvements were built including reduced vehicle lanes, porous concrete bike lanes and sidewalks, and a wall sloped toward the road, all designed to reduce runoff and maximize infiltration.

## Section 7: Utilities and Waste Management

Water and waste utilities are an important component of protecting water quality in the Lake. As mentioned in the land use section above, restriction on water and sewer extensions help reduce development pressures on parcels surrounding the Lake. The City has also adopted an enhanced street sweeping program to reduce the buildup of phosphorus-containing dust and dirt on city roads.

- **1996:** The City closed its Britton Road landfill which was used by Public Works for ditch spoil disposal.
- **1998:** The City declined a water service request for Winchester Estates, a 94 lot subdivision proposal on 47 acres adjacent to the Eagle Ridge development.
- **1998 forward:** The City funds and lends technical support to an Interlocal Agreement with the Whatcom County Health and Human Services Department to ensure that an average of 20 percent of on-site septic systems in the watershed get inspected annually.
- **2002:** The City began accelerated sweeping of watershed areas, and streets in the watershed since that time have been swept 3-4 times per month.
- **2006 - 2008:** Upgrades to critical sanitary sewer lift stations in the watershed, including a permanent generator at Northshore Lift Station, rework of Martin St. lift station to allow for drainage to the Northshore site during power outages, work towards permanent generators at Flynn St. and Lakeside lift stations, expanded wet-well storage at Lakeside and Fir St. sites, as well as upgrading all watershed sewer lift station sites to increase ability to remotely monitor these stations at all times even during power outages.
- **2003-2006:** Work on Anderson Creek restoration including removal of invasive plants and native plant establishment, site walk with Department of Ecology staff to prioritize possible enforcement activity and fencing of City-owned portion of riparian area from livestock encroachment.
- **2007-08:** City staff has completed an analysis of on-site septic systems (OSS) in the City and UGA portions of the watershed. The City funds a position within the Whatcom County Health Department through an Interlocal Agreement that is responsible for OSS management, inspections, and education within the entire lake Whatcom Watershed. This agreement has been in place since 2004.
- **2007:** Legislation passed prohibiting new septic systems in the City portion of the watershed. [Ordinance 2007-04-031].

## Section 8: Governance and Policy Coordination

Given the many jurisdictions that have authority over parts of the lake watershed, coordination at both the executive and staff levels is essential. The process and structure for joint management of the Lake has been evolving since 1990, when the Mayor of Bellingham, the Whatcom County Executive, and the Board Chair of the Lake Whatcom Water and Sewer District began to meet to discuss the creation of common goals. In 1992 the Lake Whatcom Management Committee was formed for joint planning and policy coordination at the executive level. More recently, an Interjurisdictional Coordinating Team was formed to coordinate staff activities. In 2008, a Lake Whatcom Policy Committee was formed consisting of members of the legislative bodies of the City, the County, and the Water District.

- **1990:** Executives of Whatcom County, the City of Bellingham, and the Water District began meeting to develop a joint strategy for Lake Whatcom management.
- **1992:** The Lake Whatcom Management Committee was formed for joint planning and policy coordination by the executives of the City, the County, and the Water District. At a meeting of the three legislative bodies, a Joint Resolution created a joint Lake Whatcom Management Program with explicit goals for lake protection.
- **1993:** The Lake Whatcom Management Committee developed a strategy which was adopted by the respective councils. The plan targeted land use, forest practices, spill response, conservation, public education/involvement, data/information management, stormwater, and septic systems. The land use element was adopted in conjunction with the City and County's response to the State Growth Management Act (GMA).

### Milestones in Cooperative Action

- ❖ In **1990**, the City, Whatcom County, and Water District Number 10 begin meeting to coordinate activities.
- ❖ In **1992** the Lake Whatcom Management Committee was formed for joint planning and policy coordination.
- ❖ In **1998** an Interlocal Agreement was signed by the City, County, and the Water District to formalize joint planning, policy harmonization, and shared spending.
- ❖ In **2000** the City, Whatcom County, and the Water District join a Lake Whatcom Landscape Advisory Planning Committee to create a landscape plan for DNR watershed lands.
- ❖ In **2000** the City, County, and Water District release a joint 5 year work plan.
- ❖ In **2004** a joint staff Interjurisdictional Coordinating Team was formed to improve information flows and coordinate planning efforts.
- ❖ In **2005** a second 5 year joint work plan was developed.
- ❖ In **2008** a Lake Whatcom Policy Committee began to meet, with representative from the Bellingham City Council, the Whatcom County Council, and the Lake Whatcom Water and Sewer District Board of Directors.

- **1994:** At a second joint meeting of the City and County Councils and the Water District, a second Joint Resolution was adopted creating action plans for data/information management, spill response, conservation, public education/involvement, and forest practices.
- **1995-1997:** Septic system actions began as part of a contract between the City and County.
- **1998:** The City, County, and Water and Sewer District jointly allocated \$375,000 to help implement adopted joint protection plans.
- **1998:** A third Joint Resolution was adopted by the legislative bodies of the City of Bellingham, Whatcom County, and Water District 10 creating an Interlocal Agreement, which included joint program planning, agreement on respective roles, plans for public involvement, and agreements for minimum funding for lake-related activities.
- **1999:** The 1999 Management Plan was adopted in January by the District Commissioners, the Bellingham City Council, and the Whatcom County Council, targeting actions related to land use, stormwater management, and watershed ownership.
- **2000:** A five-year work plan was developed jointly for watershed ownership, stormwater management, urbanization/land development, community outreach, data and information management, spill response/hazardous materials, fish/wildlife/forestry, transportation, recreation, and utilities and waste management, with specific priority placed on activities related to watershed ownership, stormwater management, and urbanization/land development.
- **2000:** The Washington State Department of Natural Resources formed a Lake Whatcom Landscape Advisory Planning Committee, consisting of City, County, and Water District Representatives, in response to a state legislative directive.
- **2002-2005:** Efforts of the Joint Lake Whatcom Management Program were coordinated with the Water Resource Inventory Area No. 1 (WRIA, consisting of local and state agencies, tribes, and citizens) Watershed Planning Project, and the Washington State Department of Ecology Total Maximum Daily Load (TMDL) Study. Through these efforts, additional tributary and storm event water quality and quantity data was collected to help develop and calibrate pollutant loading and lake response models, which will assist in the identification of priority areas and selection of management options to protect and enhance water quality within the Lake Whatcom watershed.
- **2004:** An Interjurisdictional Coordinating Team (ICT) was formed consisting of staff representatives from each of the three Lake Whatcom jurisdictions.
- **2005:** In 2005, the second five-year work plan was developed and adopted for the Joint Lake Whatcom Management Program, with high priority program areas as stormwater management, land preservation, and urbanization/land development.
- **2008:** A Lake Whatcom Policy Committee began to meet, and includes representative from the Bellingham City Council, Whatcom County Council, and the Lake Whatcom Water and Sewer District Board of Directors.

## APPENDIX

Table 2: City of Bellingham Lake Whatcom Watershed Property Acquisitions					
Property Acquisitions:	Purchase Price	Acres	Potential Development Units	Acquisition Date	Notes
Nielsen WS-13	\$400,000.00	35.00	18	Sep-01	Basin 2, other vacant parcels surround.
Springland LLC WS-12	\$581,000.00	9.99	29	May-02	Silver Beach expansion area.
Richardson WS-14	\$350,796.00	6.37	18	May-02	Silver Beach expansion area.
Trillium WS-11	\$1,700,000.00	198.71	40	Jul-02	Based on Watts appraisal data, other vacant parcels
Olsen WS-21*	\$409,500.00	369.00	10	Jul-02	Joint purchase 1/2 of \$819,000 includes \$94,000 timber value
Kayton WS-27	\$68,000.00	0.32	1	Aug-02	Silver Beach expansion area.
G&M Trust WS-23	\$200,000.00	4.39	9	Aug-02	100,000 donation to City (Total value: 300,000)
Wells WS-26	\$215,000.00	4.23	11	Aug-02	Ready to develop w/out subdivision
Strube WS-24	\$49,500.00	3.32	1	Sep-02	Adjacent to Nielsen property
Schieck WS-31	\$20,000.00	0.28	1	Oct-02	Silver Beach expansion area.
Owens 1 WS-29	\$33,000.00	0.20	1	Oct-02	Silver Beach expansion area.
Owens 2 WS-30	\$27,000.00	0.24	1	Oct-02	Silver Beach expansion area.
Chen WS-32	\$1,500,000.00	40.00	91	Nov-02	Vested plat UR3 Density
Solomon WS-15	\$150,000.00	21.58	1	Dec-02	CCRs prevent public access
Gaines WS-18	\$150,000.00	21.55	1	Dec-02	CCRs prevent public access
Walker WS-17	\$150,000.00	21.55	1	Dec-02	CCRs prevent public access
Strode WS-38	\$115,000.00	0.96	2	Mar-03	Prevents added development and utility extension
Mcatee WS-37	\$72,000.00	0.37	2	Mar-03	Next to Wells, completes block.
Laplant WS-35	\$45,000.00	2.01	6	Apr-03	Other vacant parcels surround, low \$/unit.
Boggs WS-36	\$15,000.00	0.28	1	May-03	Assessed value only, low \$/unit.
Hallock WS-34	\$205,875.00	3.00	6	May-03	new zoning & relief. Possible 11 units. ---> \$19,545/Unit
Zarnowitz WS-39	\$130,000.00	3.09	6	Jun-03	
Sutley* WS-20	\$379,000.00	40.00	0	Jun-03	Total \$379,000 includes \$304,000 in timber value
Hartnell WS-33	\$85,000.00	1.00	3	Jul-03	
Anderson WS-25*	\$350,000.00	36.00	7	Dec-04	Lake, streams, conservation easement. Total purchase: \$700,000
Denke WS-41	\$4,000,000.00	160.00	241	Dec-04	Steep slopes, seasonal streams, marginal reforested after logging in 1996, last large vested plat
Rohrer WS-45	\$39,000.00	0.42	2	Dec-05	Silver Beach expansion area.
Watts WS-0022	\$3,424,700.00	132.22	26	May-06	Northshore / Agate Bay
McGraw Family Trust WS-51	\$104,000.00	0.77	2	Oct-06	Silver Beach expansion area.
Erwin/Sabol WS-46	\$25,000.00	0.19	1	Nov-06	Silver Beach expansion area.
Shipp WS-49 *	\$400,000.00	10.57	2	Dec-06	Northshore /Y road/Olsen creek. Paired with a 4 acre conservation easement shown below --Total 14.57 acres.
Davis	\$810,000.00	50.00	10	Feb-07	Includes stewardship license with previous owner over 5 acres containing cabin
Donald V. Hawley Trust	\$450,000.00	10.00	2	Jun-08	Increases access area to Agate Ridge Preserve bring total acreage of preserve to 340.93
Shipp, Robert and Celeste WS - 49L	395,000	0.42	2	Dec-08	Continues ownership in area parcels and gives access and coverage to lakfront property
Three River's Timber WS-55	225,000	37.00	7	Dec-08	Conserves developable land with three streams and drainages, has major old growth alder forest
Balolia/Woodstock International WS-54	1,300,000	60.00	12	Dec-08	Continues ownership in area parcels and adds 60 acres to 105 adjacent protection parcels & cell tower with leases

Note: Data are current through 1-5-2009.

## Sources

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Lake Whatcom Management Program, *2006 Work Plan Accomplishments*, November 2006.

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Parametrix, *City of Bellingham Lake Whatcom Stormwater Management Program: Evaluation of Stormwater Phosphorus and Recommended Management Options*, October 2007.

## Notes

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<sup>1</sup> Analysis of data from the City of Bellingham Planning Department.

<sup>2</sup> Many studies have shown that roads are among the top sources of movement of phosphorus into water bodies, acting as a "conveyance" for phosphorus originating in other sources such as landscaping activities, fertilizers, detergents, and dust from disturbed land. Parametrix, *City of Bellingham Lake Whatcom Stormwater Management Program*, p. 1-13.