

RESOLUTION NO. 2005-09

**A RESOLUTION ADOPTING THE RECOMMENDATIONS OF THE LAKE WHATCOM ADVISORY BOARD FOR THE PROTECTION AND USE OF THE PROPERTIES ACQUIRED BY THE LAKE WHATCOM LAND ACQUISITION PROGRAM.**

WHEREAS, The Watershed Advisory Board (Board) was established by authority of Ordinance 2002-07-054, which is codified as Bellingham Municipal Code 2.90: and

WHEREAS, The Board's charge is to provide citizen advice regarding the Program, and, when feasible, to advise concerning proposed land acquisitions: and

WHEREAS, The Board may make a recommendation to the city staff or the City Council regarding some or all of the issues that come before the Board. The city staff or City Council may adopt, modify, or reject such recommendation. The recommendation of the Board shall be transmitted to the City Council along with the staff recommendation: and

WHEREAS, In providing recommendations, the Board shall be guided first by the overriding goal of protecting the source drinking-water quality in the Lake Whatcom Reservoir:

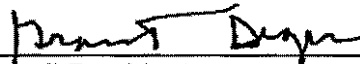
**NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BELLINGHAM:**

**SECTION 1.** The City Council accepts the recommendations of the Watershed Advisory Board with respect to the protection and management of the properties acquired by the Lake Whatcom Watershed Acquisition Program (Acquisition Program).

**SECTION 2.** The Management Recommendations for watershed Protection Properties are hereby adopted as public policy.

**SECTION 3.** The Council directs staff to use the recommendations to guide the programs and actions taken to manage and protect the properties of the Acquisition Program.

**PASSED** by the Council this 21<sup>ST</sup> day of MARCH, 2005.

  
\_\_\_\_\_  
Council President

City of Bellingham  
City Attorney  
210 Lottie Street  
Bellingham, Washington 98225  
360-676-6903

APPROVED by me this 25~~th~~ day of March, 2005.

Mark Azamb  
Mayor

ATTEST: Therese Holm  
Finance Director

APPROVED AS TO FORM:

Jean Hoisington  
Office of the City Attorney

City of Bellingham  
City Attorney  
210 Lottie Street  
Bellingham, Washington 98225  
360-676-6903



Management Recommendations for  
Watershed Protection Properties

Watershed Advisory Board

November 2, 2004

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## **EXECUTIVE SUMMARY**

The Watershed Advisory Board has earnestly pursued the primary goal expressed in the group's enabling legislation, which states, "In providing recommendations, the Board shall be guided first by the overriding goal of protecting the source drinking-water quality in the Lake Whatcom Reservoir." As a result, these recommendations center around developing a management strategy to enhance the water-quality protection capabilities of the watershed properties and to permanently protect water quality against the adverse impacts of various land-use activities.

The Lake Whatcom watershed is located in the southwestern portion of Whatcom County, Washington. Lake Whatcom serves as the primary drinking-water source for Bellingham and parts of Whatcom County. Ongoing investigations indicate that Lake Whatcom water quality is experiencing an accelerated rate of decline, with decreasing levels of dissolved oxygen and increasing levels of phosphorus. These conditions promote large numbers of undesirable algal species, such as cyanobacteria, which can be toxic.

There are many individual threats to Lake Whatcom water quality, but it is generally agreed that land clearing and residential development are the primary sources of nonpoint pollution in the watershed. The negative impacts of development are not only due to construction-related land disturbance, tree removal, and the creation of impervious surfaces, but also extend to the day-to-day activities of watershed residents. Therefore, development within the Lake Whatcom watershed presents a four-fold threat to water quality by disturbing the land, reducing natural cover, increasing impervious surfaces, and introducing additional pollutants into the community's drinking-water supply.

In keeping with the overarching goal of protecting the source drinking-water quality in the Lake Whatcom Reservoir, the Board strongly recommends that the City provide the resources to purchase as much land that is available, as soon as possible. It is apparent to the Board that the pace of land acquisitions is not proceeding as aggressively as required in order to provide the maximum protection of the watershed. Development in the watershed has accelerated over the last several years resulting in continued deterioration of water quality. At the same time the price of land has greatly appreciated, making land acquisitions more costly to the City and the County. This situation will not improve over time. The Board has concluded that implementing an accelerated land acquisition program now will still be more cost-effective than purchasing properties at the current rate. Water quality will continue to degrade resulting in more expensive, though limited, treatment options, and causing significant economic impact to the community if the lake is unable to provide acceptable source water. Moreover, infrastructure and service costs will also rise in the future. Preserving the undeveloped land and mature forests now will provide the most complete

protection for the Lake Whatcom watershed. Therefore, the Board strongly recommends that the City:

- Accelerate the acquisition of all undeveloped land that presently could be developed, land currently zoned for development, and other available parcels;
- Accelerate acquisitions that would consolidate parcels already purchased; and
- View acquisitions as a long-term (100 years or more) means to provide the permanent protection of Lake Whatcom as a drinking-water reservoir.

Other cities have achieved protection of their watersheds through long-term acquisition, and we urge the City of Bellingham to provide the processes and funds for an accelerated acquisition of property.

The Lake Whatcom Watershed Property Acquisition Program was established in October 2000. The goal of the Program is to help preserve water quality by acquiring property for permanent protection within the Lake Whatcom watershed. Financed by water usage fees, the Program's gross revenues are approximately \$1.8 million per year. To date, the Program has acquired 787 acres for \$6.7 million in land value and \$351,000 in timber value. Since its inception, the Program has acquired or otherwise protected 877 acres at a total cost of \$7,051,000.

The Board considered a number of factors in determining the most appropriate uses for property the City has acquired including cost, existing uses, enforcement of protective measures, and public benefit; however, since the primary criterion was protecting water quality, that became the guiding principle. The Board therefore recommends the following actions be taken to protect and preserve acquired property:

- *Property protection:* Establish permanent protection of property through the use of conservation easements, removal of development rights and other restrictions placed on property deeds.
- *Maintenance and restoration:* Conduct maintenance and restoration of watershed properties in a manner that maximizes their ability to sustain Lake Whatcom water quality. The best means of doing so is to manage the land to support native forest cover.
- *Jurisdiction and enforcement:* Establish and exert the authority to regulate human activities on watershed properties.
- *Public education and stewardship:* Enhance public understanding of the underlying principles of the watershed property program.

- *Personnel:* Establish human resources sufficient to support the program.

In conclusion, the Lake Whatcom Watershed Advisory Board advises this community to take seriously the charge of protecting the source of our irreplaceable municipal water supply. Investing in watershed protection is clearly not an option, but a compelling necessity. When communities invest in the protection of their drinking water they are investing in the long-term health and quality of life of their citizens.

Public health and the delivery of clean, safe drinking water are ultimately the responsibility of local governments and demand a visionary approach and commitment to a long-range comprehensive plan. The Watershed Advisory Board strongly recommends that the City make that commitment now and provide the resources needed for an accelerated land acquisition program. The Board will continue to provide recommendations to the City and will endeavor to convey to the public at large the reasoning, the latest science, and the sense of urgency to accomplish this task.

*The Watershed Advisory Board is a committee of citizens appointed by the mayor of the City of Bellingham.*

*For further information on the Property Acquisition Program, contact Lance Rexroat, Property Acquisition Specialist, Public Works, 210 Lottie Street, Bellingham, WA 98225, (360) 676-6961 ext. 387.*



## **BACKGROUND**

### ***Purpose***

The primary purpose of this document is to serve as a vehicle for the Watershed Advisory Board's ("Board") general recommendations for managing the City of Bellingham's watershed preserve properties. This document also presents background information regarding the activities of the Lake Whatcom Watershed Property Acquisition Program ("Program") and the Board.

### ***Scope***

These recommendations apply to the watershed protection properties purchased through the Program.

### ***The Lake Whatcom Watershed***

The Lake Whatcom watershed is located in the southwestern portion of Whatcom County, Washington. Nearly 80% of the watershed is zoned for forestry and managed by private companies or the Washington State Department of Natural Resources.<sup>1</sup> The watershed is about 36,270 acres (56.7 sq. mi.), of which about 31,220 acres (48.8 sq. mi.) is land. Lake Whatcom itself is about 4,994 acres (7.8 sq. mi.); other water surfaces account for 46 acres.<sup>2</sup> The portions of the watershed that are within the city limits are comprised of 659 acres of land and 363 acres of lake.<sup>3</sup> The remainder of the watershed is in Whatcom County, except for a small area to the south that is in Skagit County.

Lake Whatcom is a large, deep, natural lake comprised of three basins separated by two sills. The basins are numbered in upstream order, i.e., starting at the north or city end of the lake. Basins 1 and 2 each contain about 2% of the lake's 243 billion gallons of water, and basin 3 contains the remaining 96%.<sup>4</sup> Basin 3 is the deepest at 328 feet maximum depth, followed by basin 1 at 95 feet and basin 2 at 69 feet (Fig. 1). The lake's sole surface outflow, to Whatcom Creek, is controlled by a manually operated dam that was constructed in 1937.<sup>5</sup>

Lake Whatcom is the primary drinking-water source for Bellingham (pop. 71,080)<sup>6</sup> and parts of Whatcom County (pop. 177,300). The City of Bellingham and the Lake Whatcom Water and Sewer District ("Water District") provide water from the lake to more than 85,000 people; further, approximately 250 households withdraw their water directly from the lake. The lake also provides 7-12 million gallons per day to the Georgia-Pacific Corporation's mill.<sup>7</sup>

The City's water intake, originally in basin 1, was relocated in the early 1940s to basin 2 beyond the foot of Cable Street. The Water District withdraws its water from basin 3 offshore from Morning Beach in Sudden Valley.

In 1962, the City started diverting water from the Middle Fork Nooksack River into Lake Whatcom via a diversion dam and a pipeline that connects with Anderson Creek, which empties into Lake Whatcom. In recent years, the

withdrawal of water from the Middle Fork has been reduced to enable the Middle Fork to meet instream flow levels required for salmon habitat.

In addition to supplying drinking water, Lake Whatcom and its watershed have areas for residential development, recreation (boating, fishing, swimming), fish and wildlife habitat, as well as aesthetic values.

### ***Lake Whatcom Water Quality Issues***

The City of Bellingham and Western Washington University (WWU) have collaborated on investigations of the water quality in Lake Whatcom since the early 1960s. Beginning in 1981, a monitoring program was initiated by the City and WWU that was designed to provide long-term data for Lake Whatcom for basic parameters such as temperature, pH, dissolved oxygen, conductivity, turbidity, nutrients (nitrogen and phosphorus), and other representative water quality measurements. The major goal of the long-term monitoring effort is to provide a record of Lake Whatcom's water quality over time. In addition, since the City and WWU review the scope of work for the monitoring program each year, short-term water quality questions can be addressed as needed. This section presents a summary of Lake Whatcom water quality issues based on the most recent research.<sup>8,9,10</sup>

Lake Whatcom is a very dynamic chemical and biological environment. Some processes tend to exhibit positive feedback loops; that is, one process can cause a change in another, which in turn can aggravate the first. This means that rates of change can speed up and conditions can worsen much more quickly than they have in the past.

The different lake basins have shown a gradation in water quality, deteriorating from the south end toward the north. Basin 2 has been intermediate in quality, but is becoming more degraded like basin 1, rather than becoming more like the cleaner basin 3.

The level of dissolved oxygen in basin 1 continues to decline. Low levels of oxygen result in, for example, release of previously-bound nitrogen, phosphorus, metals, and organics; more algal growth; methylation of mercury (which renders it more toxic); undesirable tastes and odors resulting from lake turnover; and higher levels of disinfection by-products.

Trihalomethanes (THMs) are formed when organic carbon compounds come into contact with halogens such as chlorine, which is used by the City of Bellingham water treatment plant for drinking-water disinfection. Levels of THMs in treated drinking water are increasing, most likely because the chlorine is reacting with the quantities of organic matter provided by increased amounts of algae in the lake.

The average time that water remains in the lake is longer than it was in the past because of several factors. The volumes of water diverted from the Middle Fork into Lake Whatcom have been reduced, because of curtailed operations at Georgia-Pacific, and because of instream flow requirements for salmon in the Nooksack River. There has also been below-average rainfall and runoff into the lake during the last several years.

Both the total phosphorus and biologically available form of phosphorus known as *soluble reactive phosphorus* are increasing, particularly in deeper parts of the lake. Lake-bottom sediments are a huge reservoir for phosphorus, which is important to the dynamics of the lake because some of the chemical processes taking place can re-mobilize and recycle it in biologically available form.

Stormwater treatment facilities have been built in the watershed, but they are not 100% effective. If, for example, 80% of phosphorus is removed through stormwater treatment, which is as high as most Best Management Practices aspire, the remaining 20% is still enough to provide abundant phosphorus to the algal plant community.<sup>11</sup>

Increasing biological productivity tends to favor changes in the algal species composition, and larger numbers of undesirable groups such as cyanobacteria (blue-green algae). These changes tend to aggravate the dissolved-oxygen problem.

Monitoring efforts have detected increases in both alkalinity and pH at near-surface levels. These changes are both indicators of increasing biological productivity.

### ***Watershed Land Use and Water Quality***

There are many individual threats to Lake Whatcom water quality, but it is generally agreed that residential development and its consequences are the primary sources of nonpoint pollution in the watershed.<sup>12</sup> The negative impacts of development are not only due to construction-related land disturbance, tree removal, and the creation of impervious surfaces, but also extend to the day-to-day activities of the occupants of the residences themselves. Therefore, development within the Lake Whatcom watershed presents a four-fold threat to water quality by disturbing the land, reducing natural cover, increasing impervious surfaces, and introducing additional pollutants into the community's drinking-water supply.

According to July 2004 figures from both the Bellingham and Whatcom County planning departments,<sup>13,14</sup> there are 7809 single-family residences within the Lake Whatcom watershed. Of these, 1400 homes are within the city limits, 2100 are in Sudden Valley,<sup>15</sup> and 4239 in the county and urban growth areas (Fig. 2). An additional 3119 single-family residences can still be built under current zoning, taking into account the county-wide downzone of one house per 5 acres (R5A). Of these 3119 development units, 160 are within the City, 900 are within

Sudden Valley, and the remaining 2059 are in the county and urban growth areas.

Urbanization has long been recognized as a major contributor to nonpoint pollution. Due to impervious surfaces such as roads, driveways, and rooftops, a typical city block generates nine times more runoff than a woodland area of the same size.<sup>16</sup> In forested areas, trees and ground cover slow the flow of water and the soil filters out and binds many contaminants. Water that is not absorbed or evaporated flows as runoff, carrying with it sediments, nutrients, and a varying pollutant load. This type of pollution is referred to as "nonpoint source pollution," and it is characterized by the Environmental Protection Agency (EPA) as the greatest threat to water quality nationwide.<sup>17</sup>

*Due to impervious surfaces such as roads, driveways, and rooftops, a typical city block generates nine times more runoff than a woodland area of the same size.*

Under Section 303(d) of the federal Clean Water Act, the Washington State Department of Ecology is responsible for preparing a list of all surface waters in the state for which beneficial uses of the water are impaired by pollutants. Lake Whatcom was placed on the 303(d) list in 1998 for increasing levels of oxygen depletion, and in 2004, phosphorus and other pollutants were recommended for listing by DOE.<sup>18</sup>

Because the soil in the watershed naturally contains phosphorus, runoff from land disturbance contributes to the lake's phosphorus level, which, in turn, exacerbates the lake's low dissolved-oxygen level. The low dissolved-oxygen level, in turn, causes more mobilization of reactive phosphorus as well as other substances such as mercury. Other sources of phosphorus include phosphorus-containing fertilizers, runoff from car washing with phosphate detergents, human and animal waste, and remobilization from lake-bottom sediments.

Although it is possible to treat water for a multitude of contaminants, including phosphorus, it is a difficult and expensive process. In 2002, the Trust for Public Land and the American Water Works Association conducted a study of 27 water purveyors and found that greater forest cover in a watershed correlated with lower treatment costs: for every 10% increase in forest cover, treatment costs decrease by approximately 20%.<sup>19</sup>

Unfortunately, the cost-saving benefits of land protection are often realized only too late, when the level of contaminants requires a more intensive form of water treatment resulting in expensive upgrades. For example, in the 1990s, the City of Wilmington, North Carolina, spent \$36 million in an effort to address increases in industrial and agricultural runoff.<sup>20</sup> In contrast, Auburn, Maine, spent \$570,000 to acquire and protect 434 acres of land around Lake Auburn, thereby avoiding

the necessity of spending \$30 million in capital costs and \$750,000 in annual operating costs for a new filtration plant.<sup>21</sup> On a much larger scale, the estimated cost for New York City to purchase watershed lands to protect drinking-water supplies is \$1.5 billion; it would have cost the city \$6-8 billion to build the filtration plant that would have been required to treat water from those lands if they had been developed, plus \$300 million a year in operating costs.<sup>22</sup>

We acknowledge that the foregoing examples are from other states and do not strictly apply to the situation as it exists in Whatcom County. Typically, however,

prevention of nonpoint source pollution is less expensive, and less difficult, than restoring a polluted drinking-water source.

*Watershed protection is the first and most basic step in a multi-barrier approach to drinking water protection.*

Watershed protection is the first and most basic step in a multi-barrier approach to drinking-water protection.<sup>23</sup> For this reason, many communities are developing strategies to protect their drinking-water watersheds.

### **Watershed Protection Strategies**

There are many different tools to employ in order to protect land. Conservation easements, Transfer of Development Rights (TDRs) and outright ownership are outlined below.

#### **Conservation Easements**

A conservation easement is a voluntary legal agreement between a landowner and a land trust or other qualified entity, such as a municipality, in which the owner places permanent restrictions on the future uses of their property while maintaining ownership. There are more than 1400 land-trust groups in the nation managing conservation easements, which are the nation's leading form of land protection. The landowner and land trust work together to tailor the terms of the conservation easement to the landowner's needs. Conservation easements can be amended by mutual agreement, although it is unlikely that a land trust would agree to make an easement less restrictive.

By entering into a conservation easement, a land trust accepts the obligation to monitor and enforce the terms of the easement in perpetuity. The landowner pays a stewardship fee, which is placed in a trust fund. The land trust uses the proceeds of the trust fund for expenses related to monitoring and enforcement. If a land trust becomes defunct, its funds and responsibilities are transferred to another land-trust organization. In any event, the conservation easement itself is still in force.

Benefits of a conservation easement include continued property ownership, and lower property taxes. It also is possible to donate land to a land trust. Private land donors receive a tax deduction based on the difference between the property's full market value before and after donation. Land donors usually are asked to make a cash donation to their stewardship fund. It was suggested that the City could encourage donations of watershed lands to a land trust by paying the conservation easement fee on behalf of the landowner.

The City has entered into conservation easements covering 459 acres in the watershed, and the Board has heard a presentation on conservation easements by the Whatcom Land Trust.

#### Transfer of Development Rights

The Transfer of Development Rights (TDR) is a process that conserves certain lands while shifting growth to areas deemed more appropriate for development. The lands to be protected are referred to as "sending areas," while areas slated to accommodate growth are called "receiving areas."

A TDR program permanently removes development rights from one area and strategically places them in another. Sending-area landowners who sell development rights to their land deed-restrict their property while retaining ownership and all other associated rights and responsibilities. Those purchasing development rights use them as "credits" in receiving areas to enable them to build elsewhere at a denser level for greater profit.

Whatcom County recently made some additions and refinements to its TDR program to facilitate transfers. We discussed the possibility of removing the development rights from City-owned watershed properties, and hope that the TDR program will be a useful tool in removing development from the Lake Whatcom watershed.

#### Land Ownership

Protecting watershed lands is an important first step in a multiple-barrier approach to water quality; however, regulating the use of private property is often difficult and controversial. One means of regulating watershed lands that avoids the issue of private landowners' property rights is to purchase property through a land acquisition program. Such a program allows the water system to control land use on the watershed property it owns.

Since governmental entities and nonprofit organizations do not pay property taxes, some citizens fear that removing watershed properties from the tax rolls will have a significant impact on the area's tax base. This has proven not to be the case; in fact, the cost of providing services for outlying residential areas—roads, utilities, police and fire services, schools, and so on—is higher than the tax revenue from those properties. The following examples<sup>24</sup> are from other

states and do not strictly apply to the situation as it exists in Whatcom County; however, they are offered as a general illustration.

- A study determined that the taxpayers of Woodbridge, Connecticut, were better off purchasing a 292-acre tract rather than permitting it to be developed, because the cost of supporting the development would exceed anticipated tax revenues.
- In Loudoun County, Virginia, the cost of servicing 1,000 new development units exceeded tax revenues from these properties by as much as \$2.3 million.

And although it is true that watershed land acquisition does result in properties being removed from the tax rolls, this usually does not result in large losses since the taxes received from undeveloped property are relatively low, particularly if the property had been zoned for forestry. The \$25,400 in property taxes lost due to acquisitions by the Program represents 0.016% of the \$160.67 million in total property taxes levied in Whatcom County.<sup>25</sup> We believe that the cost of providing utilities, roads, schools, and fire and police services to support the 260 development units that the Program has so far removed from the watershed would exceed the value of the taxes collected on these properties. This would particularly be true for households that are geographically widespread, since greater distances between households increases costs by necessitating longer roads, more utility infrastructure, and associated costs.

Finally, the availability of clean water has far-reaching benefits that are not readily evident and are even less easily quantified. Simply put, water is essential to life, and without safe water, people cannot lead healthy, productive lives. These far-reaching benefits are difficult to measure in terms of dollars and cents.

#### Case Studies in Watershed Ownership

##### *Seattle, Washington*

It is not necessary to venture far from Bellingham to find water suppliers who rely on watershed ownership as a means of protecting water quality. The City of Seattle's land acquisition program has earned nationwide attention for its successes.

The citizens of Seattle (pop. 572,600) voted to establish its city-owned and -operated water system in July 1889, one month after the devastation of the Great Seattle Fire revealed the inadequacies of the city's water supply. In 1895, voters approved the construction of the Cedar River water system, which is still Seattle's major source of supply. The city's first purchases were in 1898. Beginning in 1909, city leaders devised a strategy for purchasing the entire Cedar River watershed—over 90,000 acres—in order to protect Seattle's drinking water.<sup>26</sup> This goal was finally achieved in 1996, with 99.9% of the watershed under city ownership. Seattle also owns 70% of a second water source, the

South Fork Tolt watershed, the rest of which is largely owned by the US Forest Service.<sup>27</sup>

By adhering to its long-range goal, Seattle has obtained for its citizens the **permanent protection** and control of its drinking-water source.

#### *Other Washington Cities*

- The City of Everett (pop. 96,840), north of Seattle, owns the 54,000-acre Sultan Basin watershed, which receives rain and snowmelt from the Cascade Mountains. The watershed is patrolled and human activities are carefully monitored to reduce threats to water quality.<sup>28</sup>
- The City of Bremerton (pop. 37,520) owns and protects the 3,000-acre watershed surrounding the Union River water supply. The area is patrolled and public access is not permitted.<sup>29</sup>
- The City of Olympia (pop. 43,040) owns McAllister Springs, which provides water to 79% of its customers.<sup>30,31</sup>
- The City of Tacoma (pop. 196,800) receives most of its water from the Green River, and Tacoma Water owns approximately 10% of the watershed along the river. Most of the remainder is owned by timber companies and the government. Activities in the watershed are controlled through agreements with these landowners.<sup>32</sup>
- The City of Aberdeen (pop. 16,410) owns 1600 acres of its 7500-acre municipal watershed at the headwaters of the Wishkah River, and the balance is owned by timber companies. The property is fenced and patrolled.<sup>33</sup>
- The City of Hoquiam (pop. 8885) owns its 7500-acre watershed, which is closed to the public.<sup>34,35</sup>
- The City of Montesano (pop. 3375) has its own municipally-owned watershed, called the "city forest." The city owns 4946 acres which provide water as well as timber revenues for the city; the city's water is pumped from wells drilled on the property in 1973.<sup>36</sup>

## **THE WATERSHED PROPERTY ACQUISITION PROGRAM**

### ***History***

In 1991, the Lake Whatcom Management Committee ("Management Committee"), comprised of the County Executive, Bellingham Mayor, and the Manager of Whatcom County Water and Sewer District #10 (now the Lake Whatcom Water and Sewer District) developed a draft set of goals and policies to



guide management in the watershed that included twenty-one specific goals related to water quality, quantity and distribution, as well as fish and wildlife.<sup>37</sup>

The goals were presented to the Bellingham City Council, Whatcom County Council, and the Water District Commissioners, who approved a joint resolution<sup>38</sup> adopting the twenty-one goals for the Lake Whatcom watershed. The second of these goals was "To pursue public ownership and protection of the watershed whenever possible through private/public partnerships, tax incentives, transfer of development rights, land trusts, grants, etc."

In 1998, The Initiative Group (TIG) began a petition campaign for a ballot measure to add a fee to water bills to raise funds to purchase land in the watershed. The ballot measure was narrowly defeated in November 1999.

In late 1999, the jurisdictions adopted the *Lake Whatcom Reservoir Management Program for 2000*, a five-year Work Plan for the Lake Whatcom watershed. Although each of the original twenty-one water-quality goals was targeted, watershed ownership was assigned a high priority, along with land use and stormwater management.

In April 2000, the Management Committee directed the Lake Whatcom Citizens Advisory Task Force ("Task Force") to recommend a set of criteria for selecting properties for purchase. The Task Force presented its recommendations in January 2001. Their proposed criteria included:

- Proximity to water bodies
- Potential land use and development pressure
- Slope
- Current land use
- Contiguity with already purchased or otherwise conserved land

### ***The Program***

The Lake Whatcom Watershed Property Acquisition Program was established by City Ordinance 2000-09-058, which became effective October 3, 2000.

In addition to the criteria recommended by the Task Force, the City Council adopted a second set of acquisition criteria, referred to as the "overlay criteria." These criteria include:

- Proximity to Lake Whatcom
- Density (potential land use)
- Physical features
- Transportation impacts

Financed by water usage fees, the Program's gross revenues are approximately \$1.8 million per year.

The goal of the Program is to help preserve water quality by acquiring property for permanent protection within the Lake Whatcom watershed. Property ownership allows the City to control the use and development of the property so that the land can be managed in a way that best protects drinking-water quality in the Lake Whatcom Reservoir.

### ***Acquiring Watershed Lands***

The following is an outline of the land acquisition process:

- Available property is identified.
- The property is evaluated according to the acquisition criteria. If the property is highly rated, the process continues.
- Information on the property is presented to the Watershed Advisory Board, whose members provide advice and input regarding the potential acquisition.
- Staff and Watershed Advisory Board recommendations are brought before the City Council, who approves properties to be purchased.
- Property is appraised, as appropriate.
- The City makes an offer based on Council guidelines.
- Purchase and sale agreement is entered into, due diligence is completed, which includes environmental review and title review, and the transaction is closed.
- The deed is recorded; property data and map are recorded on a GIS layer.

### ***Land Acquisitions to Date***

In August 2001, the Program made its first purchase—35 forested acres above basin 2 and near other preserved properties—for \$400,000. To date, the Program has acquired 787 acres for \$6.7 million in land value and \$351,000 in timber value (Table 1).

In addition to outright purchase of land, the City accepts donated conservation easements. In 2001, the City accepted such a donation, protecting 90 acres north of Agate Bay. Such conservation easements enable owners to retain their properties and ensure watershed protection at no cost to the City. In 2002, the Program borrowed \$4 million from the City Wastewater Fund in order to take advantage of high-priority lands that had become available for purchase. This loan is being repaid at approximately \$900,000 per year for five years, including interest.

Since its inception, the Program has acquired or otherwise protected 877 acres at a total cost of \$7,051,000 (Fig. 3).

### ***The Watershed Advisory Board***

The Watershed Advisory Board was established by authority of Ordinance 2002-07-054, which is codified as Bellingham Municipal Code 2.90.

The Board consists of seven members appointed by the mayor. Each member is a citizen of the United States and an elector of the City, as well as a resident of

the State of Washington for at least three years and of the City of Bellingham for at least two years prior to appointment. Terms are for three years, and members were assigned one-, two-, and three-year terms to provide for staggered terms. The Board's present members are Kai Bretherton, Seth Cool, April Markiewicz, Stan Snapp (Chair), Susan Taylor, Peter Willing, and Myron Wlaznak (Vice Chair). Former Board members are Rud Browne, Mark Peterson, and Jonathan Sitkin.

The Board's charge is to provide citizen advice regarding the Program, and, when feasible, to advise concerning proposed land acquisitions. The five specific responsibilities of the Board are as follows (BMC 2.90.040C):

1. To provide advice and input to the city staff regarding recommended land acquisitions in the Lake Whatcom watershed.
2. To consult with and make recommendations to the city staff regarding policies for the use, maintenance and/or disposition of acquired property.
3. To encourage individuals and community/private groups or entities to donate funds and/or property to the Lake Whatcom Watershed Program.
4. The Board may make a recommendation to the city staff or the City Council regarding some or all of the issues that come before the Board. The city staff or City Council may adopt, modify, or reject such recommendation. The recommendation of the Board shall be transmitted to the City Council along with the staff recommendation.
5. In providing recommendations, the Board shall be guided first by the overriding goal of protecting the source drinking-water quality in the Lake Whatcom Reservoir. In providing these policy recommendations the Board shall be guided further by consideration of reducing development and development potential in the watershed and of creating potential for future recreational opportunities.

We held our first meeting on August 12, 2003, and have held 16 meetings since then. All meetings are held according to the provisions of the Open Public Meetings Act (RCW 42.30). Written records of Board meetings are kept and are available from the Environmental Resources division, City of Bellingham Public Works, City Hall.

The City provides staff who devote a portion of their time to supporting the Board's efforts. Support staff are: Patty Fernandez, Real Property Manager; Clare Fogelson, Environmental Resources Manager; Christina Maginnis, Field Specialist; Kjerstie Nelson, Public Works Assistant; and Lance Rexroat, Property Acquisition Specialist. Staff members attend meetings, contribute information and ideas, and keep records.

We devoted our first two meetings to becoming acquainted with our responsibilities, deciding rules of procedure, and familiarizing ourselves with individual properties. We reviewed our charge as outlined in BMC 2.90.040C, supplemented with comments by Mark Asmundson and Barbara Ryan. We elected a Chair and Vice Chair, and decided on rules of procedure, setting the groundwork for a set of bylaws. We adopted our bylaws in February 2004.

At the first meeting, we received notebook binders containing detailed information on all the properties acquired to date. In addition, staff members presented some of the more pressing issues regarding individual properties, which gave members an indication of the types of abuses taking place on some of the properties.

In addition to attending scheduled meetings, we went on field trips during which we were able to tour most of the properties. This on-the-ground experience has been invaluable to us as we address issues involving individual properties.

#### ***Issues and Uses Considered by the Board***

The primary charge to the Board was to determine the most appropriate uses for property the City has acquired. A number of factors were considered in this assessment including cost, existing uses, enforcement of protective measures, and public benefit; however, since the primary criterion was protecting water quality, that became the guiding principle.

We devoted several meetings to discussing the possible uses of the City's watershed properties and developed a Use Matrix (Table 2). While each property has its own unique set of characteristics, existing uses, public access and public expectations, a number of uses were rejected outright. These uses included Christmas tree farms, rope-climbing areas, community gardens, low impact parks, neighborhood parks, housing for a caretaker/land steward, parking lots, areas with play equipment, residential development, restrooms, yard waste facilities, and camping or day-retreat facilities.

Moreover, other uses, which on their own might be compatible with watershed protection, were in conflict with other acceptable uses and thus were rejected (e.g., hunting versus wildlife protection).

Throughout these informative and evolutionary discussions the primary consideration of the Board was protection of water quality, which helped to develop the following common understandings and management program components.

#### ***Common Understandings***

During the course of their investigations, Board members developed a number of common understandings that they used to guide their decision making:

- Clean water is crucial to the existence of our community.
  - Clean drinking water is essential to public health.
  - Clean water sustains fish and wildlife, as well as aesthetic and recreational uses.
  
- Nonpoint source pollution is the greatest threat to water quality nationwide.
  - Nonpoint source pollution comes from many different hard-to-trace sources and is difficult to assess and control.
  - Preventing nonpoint source pollution is far less difficult, and many magnitudes less expensive, than restoring a polluted drinking-water source.
  
- Nonpoint source pollution from residential development causes profound, negative effects on water quality.
  - Curbing residential development in the watershed prevents many activities that contribute to nonpoint source pollution.
  
- Protection of forested land has been shown to be the most cost-effective means of protecting drinking-water quality.
  - Drinking water from protected watersheds requires less treatment, and therefore costs less to treat, than water from unprotected watersheds.
  - A lower degree of water treatment involves fewer processes and chemicals that cause adverse public-health effects.
  
- The cost savings gained by protecting watersheds generally outweighs the value of lost property taxes.
  - Drinking water from protected watersheds requires less-expensive treatment facilities and processes.
  - The cost of providing services for outlying residential areas is higher than the tax revenue from those properties.
  - The availability of clean water affords many benefits that are difficult to measure in terms of dollars and cents.
  
- Public education is an essential element of any watershed protection program.
  - Public education in the use of best management practices can reduce adverse impacts to water quality.
  - Provided with fact-based training and adequate support, volunteer watershed stewards can play key roles in watershed protection and public education.
  
- There is no quick, single solution for our community's water-quality problems.
  - Just as there is no one source of pollution, no single management tool will meet all of our source-water protection objectives.

- Protection of forested land is only one, albeit essential, part of a long-range, multi-pronged plan to protect water quality.
- Positive results can take time to become evident when a community is contending with a situation that has developed over several decades.

### ***Components of a Watershed***

#### ***Property Management Program***

We acknowledge that purchasing watershed property is merely a first step toward watershed protection; the properties also require appropriate management. We discussed various elements that might be included in a watershed property management program; these are listed below.

#### **Property Protection**

The category of property protection includes the use of legal instruments such as Transfer of Development Rights and conservation easements, as discussed above.

#### **Maintenance and Restoration**

Maintenance and restoration activities that were discussed included:

*Trails.*—Maintain formal trails; close trails that endanger water quality; build new trails sited and designed for watershed protection. Build footbridges and other low-impact structures where required.

*Roads.*—Maintain roads where desired; close and stabilize roads that are no longer needed; maintain or remove culverts as needed.

*Forestry.*—Establish and preserve mature native forest stands. Restore forest characteristics that protect and enhance water quality. Conduct tree inventory and forest assessment; plant trees and native vegetation.

*Streams.*—Conduct stream restoration projects: remove non-native vegetation, plant native vegetation, restore stream banks.

*Property clean-up.*—Remove litter and illegally dumped materials; conduct clean-ups of newly acquired properties.

*Remove illicit structures.*—Dismantle and remove structures such as mountain-bike jumps, improvised footbridges, and so on.

*Prevent unauthorized uses.*—Use gates and other barriers where necessary to block access by motorized vehicles and to prevent dumping. Use clearly marked boundaries where necessary to prevent encroachment.

## Jurisdiction and Enforcement

A key element of managing property for water quality is the power to control human activities on those lands. The jurisdictional powers of Washington cities are addressed in Article XI, Section 11, of the Washington State Constitution, which states, "Any county, city, town or township may make and enforce within its limits all such local police, sanitary, and other regulations as are not in conflict with general laws." Therefore, the City of Bellingham can enact and enforce legislation to protect those watershed properties that lie within the city limits. The properties outside the city limits are protected by state laws against trespass and malicious mischief as they apply to private property.

## Public Education and Stewardship

A population of informed citizens is critical to the long-term success of watershed protection efforts. Many watershed protection programs have produced educational materials, such as signage, printed materials, and web sites, to increase public awareness of the relationship between land use and water quality. General information about land use in the Lake Whatcom watershed is available on the Lake Whatcom Management web site, which is in the process of being expanded and reorganized.<sup>39</sup>

In addition to public education, there are a number of watershed protection programs that rely on volunteer stewards for assistance. For example, Washington State University Extension offices in King,<sup>40</sup> Pierce,<sup>41</sup> and Jefferson<sup>42</sup> counties offer watershed steward training. Trained stewards make a commitment to donate a set number of hours to the program.

## Personnel

The management of water-protection properties is time consuming. Many other cities have dedicated staff to manage their holdings. As the amount of acreage in our program increases, so will the demand on staff time. The tasks include, but are not limited to, coordination of all phases of the goals and recommendations; restoration, education, and stewardship programs; and monitoring the properties for inappropriate uses.

## ***Problem Issues and Goals***

As we explored watershed-management issues vis á vis the City's watershed properties, we identified a number of problem issues and goals.

### Property Protection

#### *Problem Issues*

- The majority of the properties that the City has acquired are not permanently protected.
- Outright purchase of the entire watershed is not an option for the City at this time.

- Legal tools that protect property but do not entail outright ownership by the City (e.g., TDRs and conservation easements) are not being used to the greatest extent possible.

#### *Goals*

- Protect property through the use of conservation easements, removal of development rights and other restrictions placed on property deeds. The legal instruments used to establish permanent protection should be property-specific to allow some flexibility in future management.

#### Maintenance and Restoration

##### *Problem Issues*

- The City's watershed properties are only being maintained and restored as limited city resources permit. Without a dedicated program for maintenance and restoration, the watershed-protection capacity of these lands is likely to deteriorate.
- Certain watershed properties lack trees. Invasive plants, such as Himalayan blackberry, English ivy, herb Robert, reed canary grass, Scotch broom, and Japanese knotweed, abound.

#### *Goals*

- Maintain and restore the watershed properties in a manner that maximizes their ability to sustain Lake Whatcom water quality.

#### Jurisdiction and Enforcement

##### *Problem Issues*

- There are preexisting uses taking place on some properties that are detrimental to water quality, and such uses are difficult to eradicate or regulate.
- The City does not have a management plan to address emergencies occurring on watershed properties, such as lost hikers, serious injuries, or fires.

#### *Goals*

- To enact ordinances that specifically regulate activities on those watershed properties that lie within the city limits.
- To contemplate annexing watershed properties that are contiguous to the city limits, to allow for more direct control over their use.
- To make the fullest use of its authority as a landowner to regulate activities on its watershed properties outside the city limits.
- To encourage activities that have minimal or no effect on water quality and prohibit activities that have a harmful effect on water quality.
- To develop a means to enforce watershed management policies.
- To develop an emergency plan for the watershed properties.



## Public Education and Stewardship

### *Problem Issues*

- The various governments and organizations disseminating educational materials about the Lake Whatcom watershed do not consistently coordinate their efforts.
- There exists a low level of public understanding about the relationship between land use and water quality, including the effects of residential development, nonpoint source pollution, the role of conservation easements in land preservation, and related matters.
- There is a lack of signage identifying watershed properties. The public is not informed about the principles of watershed protection or notified of acceptable and unacceptable uses of the properties.
- The City as yet has no formal watershed steward program to assist public education and the protection and care of the watershed properties.

### *Goals*

- Coordinate with other educational programs in developing and delivering educational materials.
- Increase public understanding of the underlying principles of the watershed property program.
- Post signs that explain the principles of watershed property protection and notify the public of acceptable and unacceptable activities.
- Establish a watershed steward program that includes volunteer training, support, and coordination.

## Personnel

### *Problem Issues*

- Currently duties involved in property management are divided among existing staff members. The increasing demands of this program will require additional staff time.

### *Goals*

- Establish personnel resources sufficient to support the program by reassigning staff responsibilities or hiring additional staff.
- Make use of outside professional services contracts when necessary.

## **RECOMMENDATIONS**

We have earnestly pursued the primary goal expressed in the group's enabling legislation, and decided to post that goal on the wall at every Board meeting: "In providing recommendations, the Board shall be guided first by the overriding goal of protecting the source drinking-water quality in the Lake Whatcom Reservoir" (BMC 2.90.040C5). As a result, our recommendations center around developing a management strategy to enhance the water-quality protection capabilities of the watershed properties and to permanently protect water quality against the

adverse impacts of various land-use activities using a variety of methods and techniques.

In keeping with the overarching goal of protecting the source drinking-water quality in the Lake Whatcom Reservoir, the Board strongly recommends that the City provide the resources to purchase as much land that is available, as soon as possible. It is apparent to the Board that the pace of land acquisitions is not proceeding as aggressively as required in order to provide the maximum protection of the watershed. Development in the watershed has accelerated over the last several years resulting in continued deterioration of water quality. At the same time the price of land has greatly appreciated, making land acquisitions more costly to the City and the County. This situation will not improve over time. The Board has concluded that implementing an accelerated land acquisition program now will still be more cost-effective than purchasing properties at the current rate. Water quality will continue to degrade resulting in more expensive, though limited, treatment options, and causing significant economic impact to the community if the lake is unable to provide acceptable source water. Moreover, infrastructure and service costs will also rise in the future. Preserving the undeveloped land and mature forests now will provide the most complete protection for the Lake Whatcom watershed. Therefore, the Board strongly recommends that the City:

- Accelerate the acquisition of all undeveloped land that presently could be developed, land currently zoned for development, and other available parcels;
- Accelerate acquisitions that would consolidate parcels already purchased; and
- View acquisitions as a long-term (100 years or more) means to provide the permanent protection of Lake Whatcom as a drinking-water reservoir.

Other cities have achieved protection of their watersheds through long-term acquisition, and we urge the City of Bellingham to provide the processes and funds for an accelerated acquisition of property.

Having identified the areas of concern and goals outlined above, we make the following recommendations for the management of City-owned watershed protection properties.

#### Property Protection

##### *Generally*

- Because the decline of Lake Whatcom water quality is becoming an increasingly critical issue, the Lake Whatcom Land Acquisition Program requires an elevated level of urgency from the City Council.
- Because Lake Whatcom water quality is deteriorating at an accelerated pace, the Program needs to speed up the land acquisition process.

- Because property ownership is the most direct means of watershed protection, property in the Lake Whatcom watershed should be purchased and permanently protected from development to protect the source.

*Specifically*

- To permanently deed-restrict acquired property using conservation easements, transfer of development rights, and other legal measures.
- To annex City-owned property so that the City has full legal authority to legislate uses and provide enforcement.

Maintenance and Restoration

*Generally*

- Because undisturbed land, trees, and other vegetation are a critical component of water-quality protection, we recommend that the City manage its watershed properties primarily as a native forest. We recommend that the City develop a forest-management plan for properties without intact forest ecosystems. Approval for all other activities will be made on a property-by-property basis.

*Specifically*

The best means of protecting water quality is to manage the land to support native forest cover. Ways to achieve this include:<sup>43</sup>

- To preserve soils, associated living organisms and soil-building processes.
- To maintain diversity of forest structure and composition.
- To encourage the growth of native plant species.
- To control invasive non-native plants.
- To use natural regeneration as the primary means of management, employing plantings where native regeneration is not sufficient for desired growth.
- To preserve and enhance habitat for native animals including mammals, birds, fish, reptiles, and invertebrates.
- To employ an adaptive management strategy to allow ongoing evaluation of results and conception of new strategies.

We recommend that management of all properties should include the following activities:

- Establishing formal trails built to control erosion and preserve soils
- Closing out unnecessary roads and trails
- Removing unnecessary culverts
- Controlling access to allow hikers while blocking access for motorized vehicles
- Cleaning up trash

## Jurisdiction and Enforcement

### *Generally*

- Because human activities taking place on the City's watershed protection properties can detrimentally affect water quality, we recommend that the City take steps to control activities taking place on its properties outside the city limits.
- Because the effect of land-use activities on water quality may not always be self-evident, and to provide specific guidelines to enforcement personnel, we recommend the adoption of an ordinance governing human behavior on city watershed property.
- Because activities detrimental to water quality do and will take place on the City's watershed properties, we recommend that watershed protection policies be enforced.

### *Specifically*

- To do whatever is necessary to formalize its control over City-owned watershed properties.
- To protect watershed properties within the city limits through an ordinance. This ordinance should be separate from, and afford a higher degree of protection than, the existing ordinance governing city parks (BMC 8.04).
- To work with the Whatcom County Sheriff to enforce applicable State laws regarding trespassing and malicious mischief.
- To take physical steps to protect acquired property from actions and activities that have an adverse impact on the land and water quality.
- To determine the appropriate restrictions for individual properties.
- To place signs on all properties.
- To post both acceptable and unacceptable uses and provide 24-hour contact information.
- To install fences, gates, and other access constraints where appropriate.
- To carry out routine inspections by city staff, land stewards, general public, environmental groups, students, and land trust.

## Public Education and Stewardship

### *Generally*

- Because public understanding is essential to the success of the Program, we recommend that the City undertake to educate the public regarding the Program and its goals by developing signage, printed materials, and web-site information.
- Because volunteer watershed stewards can be valuable in monitoring and caring for watershed properties as well as community education, we recommend the establishment of a volunteer watershed steward program.

### *Specifically*

The stewardship program will involve a three-tiered process:

*Community training.*—Establish a Watershed Steward training program similar to the Master Gardener program, in which community members receive training and in return volunteer a set number of hours to the watershed-protection effort.

*Public information.*—Coordinate with the Public Works education staff to provide information about watershed stewardship practices, the role of land use in water-quality preservation, and the role of forests in water-quality protection.

*Watershed Steward program.*—Establish a training program for volunteer land stewards for each property purchased in this program. Land stewards, who would generally be neighbors, would visit the property on a regular basis, talk informally to other users about stewardship practices, and report any unauthorized trail/structure building or inappropriate use to Public Works staff.

### Personnel

#### *Generally*

- Because the activities outlined above will require personnel to accomplish them, and because Program funds can be used for property maintenance and administration, we recommend that individuals be hired as needed to achieve the Program's goals.

#### *Specifically*

- To achieve all of the Goals and Recommendations of the Board, additional staff time and resources will be required.

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