

**Exhibit A – Planning Commission Approved Draft**

*October 29, 2021*

*Chapter 10 - Environment*

**Chapter Ten  
Environment**

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**Introduction**

Each person in Whatcom County has a fundamental right to a healthful and safe environment in which to live and grow. With this right comes a responsibility to contribute to the protection and enhancement of our natural environment. Consequently, an important goal of the Whatcom County Comprehensive Plan is to protect or enhance the county's environmental quality. This means that, individually and collectively, we have the obligation to protect these resources for our children and their children. Essential to this is the establishment of safe development practices and patterns that do not significantly disrupt ecosystems and that ensure the continuation of ample amounts of clean water, natural areas, farmlands, forest lands, and fish and wildlife habitat.

**Chapter Organization**

This chapter is composed of an introduction and four sections organized by topic heading. The first section, entitled "General Environmental Management," addresses general environmental goals and policies. The remaining three sections deal with Natural Hazards, Water Resources, and Ecosystems. Together, the sections of this chapter provide the direction necessary to ensure and promote long-term sustainability of the environment in Whatcom County.

**Purpose**

Whatcom County's natural environment, with its seasonally abundant supply of water, its beauty, and its other natural resources, has attracted people to our community for generations. This setting is important to our sense of well-being, to our health, to our economic well-being, and to our future. Sustaining these assets in the face of increasingly intense human activity becomes more difficult each year. The challenge of protecting this environment while accommodating growth requires maintaining guidelines for development so that growth does not ultimately overrun the very assets that brought most of us here. The purpose of this chapter is to create such guidelines.

**GMA Goals and Countywide Planning Policies**

GMA Planning Goal 10, "Environment" (RCW 36.70A.020(10)), provides the directive for much of this chapter. It requires Whatcom County to "protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water." In addition, some of the goals and policies of this chapter support Planning Goal 9, "Open Space and Recreation" (RCW 36.70A.020(9)), which directs the county to "conserve fish and wildlife habitat."

Relative to environmental protection, Whatcom County's Countywide Planning Policies (CWPP) give the most attention to water issues. They state, "The quality of life and economic health of Whatcom County communities depend on the maintenance of a safe and reliable water supply. All jurisdictions and water

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1 purveyors should cooperate to ensure the protection and quality of the area's water  
2 resources." Specific policies address water, promoting inter-jurisdictional  
3 cooperation in conserving, protecting, and managing the water resource, and in  
4 reducing water pollution (CWPP Policies N.1 – 6). The CWPPs also support  
5 protecting wildlife habitat and corridors, natural drainage features, and "other  
6 environmental, cultural and scenic resources."

### 7 **GMA Requirements**

8 The GMA requires Whatcom County to identify and manage critical areas in such a  
9 manner as to prevent destruction of the resource base and reduce potential losses  
10 to property and human life. The GMA has identified Critical Areas to include the  
11 following areas and ecosystems:

- 12 • Wetlands
- 13 • Critical Aquifer Recharge Areas
- 14 • Fish and wildlife habitat conservation areas
- 15 • Frequently flooded areas
- 16 • Geologically hazardous areas

### 17 **Environmental Setting**

18 Whatcom County bedrock geology can be divided into five bedrock geologic  
19 provinces. From east to west these provinces are the Methow terrain, the Cascade  
20 Crystalline Core, the Northwest Cascades System, the Fraser Lowland, and the San  
21 Juan Island system. Tectonic activity over the past 15 million years has created the  
22 present North Cascades and the formation of Mount Baker, a 10,000-foot high  
23 composite volcano.

24 The mountains of Whatcom County, as well as the streams, lakes, valleys, hills, and  
25 shoreline features are the result of millions of years of geologic events. Over 2.5  
26 million years ago, during the Ice Ages, glacial ice invaded the Puget Sound lowlands  
27 from the north at least four times, with the last major glacial event, the Fraser  
28 Glaciation, ending approximately 12,000 years ago. A minor advance of glacial ice,  
29 the Sumas Advance, ended approximately 10,000 years ago. The ice formed from  
30 the accumulation of snow in the British Columbia Coast Range and interior of British  
31 Columbia. Numerous glaciers are still present within the mountains of Whatcom  
32 County, and some of these mountain glaciers formerly extended far down the  
33 mountain valleys of the County. The underlying bedrock was deeply eroded during  
34 these glacial events creating very steep mountainsides, and in some areas,  
35 particularly in northwestern Whatcom County, a thick sequence of glacial related  
36 sediments was deposited. The glacial ice was approximately 6,000 feet thick in the  
37 vicinity of Bellingham.

38 Two main glacial advances are the most important to our area, the Salmon Springs  
39 glaciation and the later Vashon glaciation. Each time the massive glacier advanced,  
40 it dammed up the Puget lowlands to form a huge lake. As the floating ice melted,  
41 sand, gravel, clay and occasional boulders would melt out of the ice and fall to the  
42 sea floor. This deposit, the Bellingham Drift, covers the ground surface over a large  
43 area of western Whatcom County. Each time the Ice Age glacier advanced, it also  
44 compacted underlying sediments with its great weight. It created a concrete-like

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1 material called "till" (also known as "hardpan") beneath it. Because the Bellingham  
2 Drift consists primarily of clay and silt, it is relatively impermeable; water tends to  
3 accumulate on the ground surface. Wetlands are common on the Bellingham Drift.

4 On the bottom of the lake, "rock flour", the finely ground remains of rocks  
5 pulverized by glacial action, settled out. These deposits became the familiar "blue  
6 clays" of the Puget lowland. The milky color of the Nooksack River is due to the  
7 same kind of rock flour, created by glacial activity on the slopes of Mount Baker.

8 Additionally, each time the glacier retreated, water from the melting ice deposited  
9 thick layers of sand and gravel known as "outwash." The outwash areas are  
10 typically where we find our most productive aquifers, since these loose sands and  
11 gravel are porous and drain rapidly. While these areas absorb rainwater for our  
12 later use from wells, they are also vulnerable to contamination. An example of this  
13 phenomenon is found in the outwash sands and gravels resulting from the Sumas  
14 Advance. Large meltwater streams and rivers flowed from this glacier depositing  
15 the Sumas Outwash sands and gravels. The Sumas Outwash sands and gravels  
16 make up the best non-floodplain farmland in the County and some of the highest  
17 quality construction gravel deposits. Abandoned outwash channels were formerly  
18 used as sources of peat.

19 Each of these glacial sediments, lake bed deposits, till and outwash is present in  
20 various places and in varied combinations in Whatcom County. These sediments  
21 provide both the formations that hold the groundwater for many of the area's wells,  
22 and the parent material for most of the different soils.

23 Out of these long physical processes a complex natural ecology has emerged that  
24 supports a diversity of wildlife. Many of our lakes, rivers, and streams support fish  
25 including, but not limited to, native species such as the five pacific salmon  
26 (Chinook, Coho, Sockeye, Chum, Pink) as well as Steelhead, Rainbow Trout,  
27 Cutthroat (coastal and resident), Bull Trout, and Dolly Varden. Every year salmon  
28 return to spawn in the streams and rivers of Whatcom County. Whatcom County is  
29 located within the Pacific Migratory Flyway and serves as a stopover and critical  
30 habitat area for many migratory birds. Bufflehead and goldeneye ducks winter here.  
31 Additionally, numerous bird species including scoters, snow geese, trumpeter  
32 swans, canvasbacks, cormorants, grebes, loons, and other migrating waterfowl  
33 pass through every spring and fall as they travel between their breeding grounds in  
34 Alaska and Canada and their wintering grounds in California and Mexico. Mallards,  
35 Canada geese, great blue herons, and numerous songbirds live in the county  
36 year-round. Maintaining these unique resources is a high priority for both present  
37 and future county residents. Whatcom County is home to a distinct subspecies of  
38 the Great Blue Heron, which has the third largest colony in the Puget Sound area.  
39 The wetlands, fields, streams, and nearshore habitat in the county support many  
40 birds of special concern, such as the bald eagle (protected under the Bald and  
41 Golden Eagle Protection Act), the pileated woodpecker (candidate for State  
42 threatened list), and the peregrine falcon (ESA candidate species). The National  
43 Audubon Society has designated Semiahmoo, Drayton Harbor, and Birch Bay as  
44 "Important Bird Areas."

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**1 Environmental Management**

**2 Introduction**

3 General environmental goals and policies are intended to provide guidance for  
4 environmental management that will promote environmental protection and good  
5 stewardship practices through a balance of public education and involvement;  
6 incentives, acquisition, and voluntary programs; land use planning and regulations;  
7 environmental monitoring; and intergovernmental cooperation. These goals and  
8 policies are also intended to provide guidance to County government as it assists its  
9 citizens in maintaining a balance between individual property rights, economic  
10 development, and environmental protection.

**11 Background Summary**

12 Development in the last 100 years has had a significant impact on the natural  
13 environment in Whatcom County. At the turn of the 20<sup>th</sup> century, some areas  
14 surrounding Lynden, Sumas, and Ferndale were logged, drained, and converted to  
15 agricultural land and other types of development. In the intervening years, many of  
16 the remaining forests were logged, many streams re-routed and channelized, and  
17 much of the native vegetation removed and replaced with a wide variety of  
18 introduced vegetative types. Roads now crisscross most areas, with homes, farms,  
19 businesses, and industries scattered throughout the county.

**20 Issue, Goals, and Policies**

21 There are designated lands in Whatcom County that can still accommodate  
22 development. Whatcom County also has areas that are sensitive to human activity,  
23 including wetlands, streams, lakes, and marine shorelines, and lands that can pose  
24 a hazard to the community, including floodplains and unstable slopes. In these  
25 areas development must be carefully planned or limited to maintain environmental  
26 quality and public safety. This can be done through the creation and  
27 implementation of goals and policies that seek to reduce hazards and prevent  
28 adverse environmental impacts.

**29 Community and Environmental Protection**

30 The elements of the natural environment: water, air, soil, plants, and animals; are  
31 interconnected and interdependent, functioning as one dynamic ecosystem.  
32 Environmental resources within this ecosystem are extensive and, in some cases,  
33 irreplaceable. They provide important beneficial uses to the community such as: the  
34 supply of clean drinking water; management of stormwater run-off and flood  
35 hazard management; support for a wide variety of fish and wildlife; fresh air; and a  
36 sense of place in which residents invest, enjoy, and expect.

37 Some of these same resources result in serious environmental constraints or pose a  
38 hazard to development and a danger to the community. Flooding in the Nooksack  
39 River is frequent and impacts much of the valley floor. There are numerous  
40 wetlands and hydric soils throughout the lowlands that provide critical wetland  
41 functions and are generally unsuitable for development. The steep gradient and

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- 1 geologic structure of the mountain ranges in conjunction with heavy annual  
2 precipitation can contribute to slope instability and flood-prone drainage basins.
- 3 Much of the environmental degradation and destruction to property occurs as a  
4 result of a lack of information or understanding rather than willful action.  
5 Ecosystems are subtle and complex. Too often both their benefits and hazards are  
6 not readily apparent to the community. Additionally, baseline information is not  
7 always available to help identify the real costs or hazards of building in Whatcom  
8 County. There is a need for further research and education.
- 9 **Goal 10A: Protect natural resources and systems, life, and property**  
10 **from potential hazards.**
- 11 Policy 10A-1: Support good stewardship of Whatcom County lands, and apply  
12 this principle to the management of public lands.
- 13 Policy 10A-2: Protect the environment through a comprehensive program that  
14 includes voluntary activity, education, incentives, regulation,  
15 enforcement, restoration, monitoring, acquisition, mitigation,  
16 and intergovernmental coordination.
- 17 Policy 10A-3: Continue to identify, designate, and protect Critical Areas and  
18 other important environmental features.
- 19 Policy 10A-4: Manage designated Critical Areas as needed, to minimize or  
20 protect against environmental degradation and reduce the  
21 potential for losses to property and human life.
- 22 Policy 10A-5: Actively pursue voluntary, cooperative, and mutually beneficial  
23 efforts aimed at advancing county environmental goals.
- 24 Policy 10A-6: Aim to meet or exceed national, state, and regional air quality  
25 standards. Work with the Northwest Clean Air Agency to ensure  
26 compliance with applicable air quality standards.
- 27 Policy 10A-7: Using Best Available Science, support efforts to educate and  
28 inform the public as to the benefits of a healthy and viable  
29 environment, ecologically fragile areas, and their economic and  
30 social value.
- 31 Policy 10A-8: Lead and/or coordinate efforts with property owners, citizen  
32 groups, and governmental and non-governmental agencies in  
33 furthering Whatcom County's environmental goals and policies.
- 34 Policy 10A-9: Cooperate with state and federal agencies and neighboring  
35 jurisdictions to identify and protect threatened and endangered  
36 fish and wildlife species and their habitats.
- 37 Policy 10A-10: Support acquisition, conservation easements, open space, and  
38 other such programs to protect high-value natural areas as  
39 identified through the GMA planning process, the Natural  
40 Heritage Plan, the state Priority Habitats and Species (PHS)  
41 program, the Lake Whatcom Management Program, and other  
42 sources.

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- 1 Policy 10A-11: Designate high-value open space and natural areas for  
2 acquisition, conservation easements, open space, and other  
3 such programs to protect these natural areas upon request or  
4 consent of the property owner.
- 5 Policy 10A-12: Broadly inform the people of Whatcom County of the locations  
6 of potential development constraints associated with natural  
7 conditions. Information should include known natural hazards  
8 and an assessment of the potential danger to both the property  
9 owner and the public.

10 **Administration and Regulation**

11 There are currently a multitude of regulations and administrative processes at the  
12 federal, state and local level that, together, have become excessive and difficult to  
13 understand. Conflicting regulations and complicated administrative processes can  
14 create undue hardship on community members and result in reduced levels of  
15 environmental protection.

16 **Goal 10B: Simplify and harmonize regulations relating to the**  
17 **identification, delineation, and protection of**  
18 **environmental features.**

- 19 Policy: 10B-1: Develop, as a significant component of a comprehensive  
20 environmental management program, non-regulatory measures  
21 that include voluntary activity, education, incentives,  
22 restoration, acquisition, advanced mitigation (i.e., mitigation  
23 done in advance of impacts), and intergovernmental  
24 coordination.
- 25 Policy 10B-2: Provide incentives for good stewardship of the land through the  
26 use of non-regulatory and innovative land use management  
27 techniques.
- 28 Policy 10B-3: Support education as an important tool in developing public  
29 appreciation for the value of ecosystems and provide the public  
30 with informational materials and presentations relating to  
31 natural system functions, regulations, and issues.
- 32 Policy 10B-4: Promote cooperation and coordination among involved  
33 government agencies when multiple agencies have jurisdiction  
34 over aspects of a single project.
- 35 Policy 10B-5: Process the environmental review of building and development  
36 permit applications within an established timeframe that is  
37 predictable and expeditious.
- 38 Policy 10B-6: Provide clear, timely, appropriate, and understandable direction  
39 to citizens, developers, and property owners.
- 40 Policy 10B-7: Ensure regulations are as simple and easy to understand as  
41 possible and maintain effective inspection, compliance, and  
42 enforcement measures as necessary.

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~~Policy 10B-8: Recognize the policies of the Whatcom County Shoreline Management Program as constituting a "Shoreline Element" of this plan. The shoreline program regulations and policies shall be considered to be consistent with this plan.~~

**Comment [CES1]:** No longer needed, as a new Chapter 11, Shorelines, has been created.

**The Environment and Property Rights**

Prior to the 1970s, growth in Whatcom County was relatively slow and received little management. As a result, private property owners were left to their own resources as they determined how best to use their land. However, as increasing numbers of people moved to this area and settled, a greater demand was placed on Whatcom County's natural resources.

The problems that arise from this situation have caused many to realize what one person does with his/her property may have an impact on the larger environmental system that sustains us as a community and on the rights of other property owners.

Land use decisions can no longer be considered exclusively private matters. We are aware public actions impact every private citizen in Whatcom County and private actions may have public consequences as well. To that end, the law must protect the public good from detrimental private actions. Nevertheless, the right of the individual to use his or her property, within the bounds permitted by law, is a value supported by law and the community and must be recognized when making land use decisions in Whatcom County.

**Goal 10C: In implementing environmental policies, provide for protection of private property rights, economic opportunities, and plan appropriately for growth.**

Policy 10C-1: Actively pursue voluntary and cooperative efforts that advance Whatcom County's goals in a mutually beneficial manner.

Policy 10C-2: When adopting new environmental protection programs, consider multiple economic parameters including development objectives, impacts, and the economic benefits of the natural environment as both a resource and an amenity.

Policy 10C-3: Emphasize an approach to environmental protection by encouraging the use of conservation easements, open space taxation, land acquisition, purchase/voluntary, workable transfer of development rights, and other mechanisms that assist affected property owners.

Policy 10C-4: Avoid standards and procedures likely to require compensation to property owners or invalidation of such rules.

**Climate Change**

Climate change is a global phenomenon that has the potential for significant local impacts to natural resources, ecosystem functions, as well as human health, infrastructure, and the economy. In Washington State, the Climate Impacts Group (CIG), a consortium of scientists at the University of Washington, has done the

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1 most extensive analysis of potential local climate change impacts in the Pacific  
2 Northwest. Based on a range of climate change model projections, as well as peer-  
3 reviewed scientific publications, the CIG concludes that during the next 20-40 years  
4 the Pacific Northwest climate may change significantly. See *Climate Change*  
5 *Impacts and Adaptation in Washington State: Technical Summaries for Decision*  
6 *Makers, Climate Impacts Group, University of Washington, December 2013*. The  
7 CIG confirms that global climate models project mid-21<sup>st</sup> century temperatures in  
8 the Pacific Northwest higher than the natural range of temperature observed in the  
9 20<sup>th</sup> century. The CIG reports that as a result of likely climate change, causing  
10 slightly higher average annual temperature, impacts to the Pacific Northwest will  
11 likely affect a broad spectrum of the natural environment, but most notably  
12 changes to water resources, including:

- 13 • More precipitation falls as rain rather than snowfall in the Cascades due to an  
14 increased snow-line elevation;
- 15 • Decreased (winter) mountain snowpack and earlier (spring) snowmelt;
- 16 • Higher winter streamflow in rivers that depend on snowmelt;
- 17 • Higher winter streamflow in rain-fed river basins resulting in scouring floods  
18 that negatively affect salmon populations if winter precipitation and rain-on-  
19 snow events increases in the future as projected;
- 20 • Earlier peak (spring) streamflow in rivers that depend on snowmelt;
- 21 • Lower summer streamflow in rivers and streams; and,
- 22 • Decreased water in summer for irrigation, fish, human consumption and  
23 recreational use (more drought-like conditions).

24 Climate change impacts are likely to include longer-term shifts in forest types and  
25 species, potentially increasing wildfire risk and greater exposure to insects and  
26 disease. Nearshore and riverine fisheries may be subjected to increased stress due  
27 to even lower average summer stream flows (and higher summer stream  
28 temperatures) and increased acidity in Puget Sound. Agricultural sector concerns  
29 include the cost of climate adaptation, development of more climate-resilient  
30 technologies, and management and availability of adequate water supplies.  
31 Susceptibility to natural hazards is also expected to intensify due to climate change,  
32 including increased landslides, erosion, and coastal and riverine flooding due to  
33 more winter rainfall, and potential rising sea levels.

34 In 2007, Whatcom County completed a Climate Protection and Energy Conservation  
35 Action Plan that laid out specific actions and targets for reducing greenhouse gas  
36 emissions and increasing energy conservation efforts in response to potential  
37 climate change.

38 In addition many insurance industry experts are now factoring in the costs of  
39 climate change into insurance premiums as the increase in the frequency and  
40 severity of extreme weather events around the world results in a corresponding  
41 increase in claims costs.

42 Local government, residents and businesses must anticipate that as the climate  
43 changes, more frequent and severe damage to private and public infrastructure will



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- 1 occur. Maintenance costs and insurance premiums can be expected to increase  
2 accordingly.
- 3 **Goal 10D: Strengthen the sustainability of Whatcom County's**  
4 **economy, natural environment, and built communities by**  
5 **responding and adapting to the impacts of climate**  
6 **change.**
- 7 Policy 10D-1: Whatcom County's natural resource-based economic sectors,  
8 ecosystems, water resources, infrastructure, emergency  
9 management, and public health all face climate change related  
10 risks in the future. The County should consider potential long-  
11 range climate change implications into its on-going functional  
12 planning and implementation actions. The County should:
- 13 1. Study the resilience of its natural and built environments to  
14 the potential impacts of climate change;
  - 15 2. Identify the relative vulnerability of these sectors to climate  
16 change; and,
  - 17 3. Examine the adaptive capacity of these sectors to cope with  
18 or mitigate climate change and take advantage of any  
19 beneficial opportunities.
- 20 Policy 10D-2: Develop strategies that encourage a diversified and sustainable  
21 economy that is resilient to the impacts of climate change.
- 22 Policy 10D-3: Promote the efficient use, conservation, and protection of water  
23 resources.
- 24 Policy 10D-4: Pursue strategies to reduce the vehicle miles traveled (VMT) in  
25 the county by encouraging expanded availability and use of  
26 public transportation, carpooling, and non-vehicular modes of  
27 transportation.
- 28 Policy 10D-5: Establish land use patterns that minimize transportation-related  
29 greenhouse gas emissions and encourage preservation of  
30 natural resource lands and the protection of water resources.
- 31 Policy 10D-6: Convene a climate impact advisory committee by 2017. The  
32 advisory committee should consist of (but not be limited to)  
33 experts in energy efficiency and carbon emission reduction,  
34 representatives from Whatcom County, and interested  
35 community members. The committee will be tasked with:
- 36 • Evaluating Whatcom County's compliance with meeting  
37 targets set forth in the 2007 Climate Plan;
  - 38 • Establishing new targets that meet or exceed state and  
39 federal climate impact goals;
  - 40 • Updating the Climate Plan, at minimum every five years, or  
41 as needed to meet targets;
  - 42 • Recommending updates to the Whatcom County

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- 1 Comprehensive Plan in accordance with meeting Whatcom  
2 County’s emission reduction goals;
- 3 • Ensuring that Whatcom County government facilities and  
4 operations are designed to meet or exceed goals and  
5 standards resolved in the current Climate Protection and  
6 Energy Conservation Action Plan; and
- 7 • Recommend updates to Whatcom County land use policies  
8 and development regulations to support renewable energy  
9 development goals.
- 10 Policy 10D-7: Encourage sustainability by developing strategies and practices  
11 to increase the use of renewable, net-neutral carbon energy in  
12 Whatcom County facilities and County vehicles, with a goal of  
13 net zero man-made carbon emission by 2050.
- 14 Policy 10D-8: Encourage sustainability by developing strategies and practices  
15 to reduce landfill waste from Whatcom County government  
16 facilities to near zero.
- 17 Policy 10D-9: Identify responsible parties and agencies and encourage them  
18 to identify and properly seal and/or burn methane that is  
19 escaping into the atmosphere from wells.
- 20 Policy 10D-10: Create updates to Whatcom County land use policies and  
21 development regulations to support renewable energy  
22 development goals.
- 23 Policy 10D-11: Protect ecological functions and ecosystem-wide processes of  
24 Marine Resource Lands and critical areas in anticipation of  
25 climate change impacts, including sea level rise.

**Comment [P/C2]:** Suggested by Re-Sources, Futurewise, & WEC. P/C approved 8-0-0 (1 absence).

26 **Natural Hazards**

27 **Introduction**

28 The location, climate, and geology of Whatcom County combine to create many  
29 natural hazards to people and their developments. Earthquakes, volcanoes,  
30 landslides, and flooding are some of the major natural hazards found in our region.  
31 Additionally, old mines are scattered around the county that could be dangerous to  
32 the community. Natural Hazards goals and policies are intended to provide  
33 guidance to county government as it assists its citizens in effectively managing  
34 natural hazards in a manner that minimizes the danger to each member of this  
35 community, while continuing to provide for economic opportunities.

36 **Background Summary**

37 Natural Hazards include the following (**Map 10-4**):

38 **Landslide Hazards** – The geologically recent retreat of glaciers from the Whatcom  
39 County landscape, succeed by contemporaneous geomorphic processes of erosion,  
40 sediment transport, deposition, isostatic rebound and tectonic uplift, has left many

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1 hillsides over-steepened and susceptible to naturally occurring and human-  
2 triggered slope failure and erosion. Several large, well-known landslides are  
3 presently active in Whatcom County, such as the Swift Creek Slide on Sumas  
4 Mountain. In addition, numerous large-scale, pre-historic slope failure deposits  
5 have been mapped by past workers and are readily identified in more recently  
6 available LiDar imagery. Various slope failure processes contribute to the mosaic of  
7 landslide hazards present in the county and the potential exists for a multitude of  
8 impacts ranging from periodic small- to large-scale rockfall and slides, massive  
9 debris slides and avalanches, destructive debris flows, and deep-seated earthflows,  
10 slumps and slides. These landslide processes act on large- and small-scale, and  
11 though much less catastrophic in nature, smaller landslides occur more frequently  
12 and pose a continual hazard to County residents and infrastructure. Certain types of  
13 geologic conditions and formations commonly cause landslides, namely the  
14 Chuckanut Formation and the Darrington Phyllite, but are also frequently observed  
15 in unconsolidated glacial sediments, in the presence of day-lighting groundwater  
16 seams and springs, on slopes in excess of 35 percent, along coastal bluffs, and in  
17 areas of fluvial erosion.

18 **Alluvial Fan Hazards** – Alluvial fan hazards areas exist where steep mountain  
19 streams flow onto floodplains or into lakes and deposit debris and sediment.  
20 Because these streams are steep and flow in confined canyons, they can carry more  
21 sediment and debris than a similar-sized stream flowing over flat land. During a  
22 large storm, streams on alluvial fans can create catastrophic flooding and debris  
23 floods, such as were experienced in 1983 in the Lake Whatcom area. During this  
24 storm event, the Sudden Valley development on Lake Whatcom incurred significant  
25 damage to property from flooding and debris flows on the Austin Creek alluvial fan.

26 **Flood Hazards** – Heavy winter rains and a transient snowpack combined with the  
27 steep and sometimes unstable slopes of Whatcom County's foothills create  
28 conditions ideal for flooding and debris flows along many of our rivers and streams.  
29 The Nooksack River floodplain alone covers 38,000 acres in Whatcom County. In  
30 1989 and 1990, the Nooksack River overflowed and flooded lowland Whatcom  
31 County causing millions of dollars of damage. During some extreme floods, the  
32 Nooksack River overflows near Everson and adversely impacts residents along  
33 Johnson Creek in Sumas, and in the Abbotsford area of British Columbia. It is  
34 projected that climate change will increase flood risk, due to increased sea level  
35 and changes in rainfall patterns. Significant damage may result from such floods. In  
36 1991, Whatcom County formed a countywide Flood Control Zone District to address  
37 the major flooding issues in the county.

38 **Volcanic Hazards** – The presence of Mt. Baker is an asset to our region. Its  
39 10,778-foot peak is one of the dominant features of Whatcom County's landscape.  
40 However, Mt. Baker is also considered one of the most active volcanoes in the  
41 Cascade Range, and of the six major volcanoes in the range, Mt. Baker is  
42 considered by geologists to be very hazardous during and after an eruption.  
43 Pyroclastic flows, ash flows, and especially volcanic mudflows, also known as  
44 lahars, are believed to be the greatest dangers to human life and development in  
45 Whatcom County. Geologic evidence indicates that an eruption on Mt. Baker caused

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1 a major lahar about 6,600 years ago that inundated the Middle Fork Nooksack  
2 Valley from its headwaters downstream past the confluence with the North Fork at  
3 Welcome. The same lahar is now known to have been over 300 feet deep in the  
4 upper reaches of the Middle Fork and extended as far west as Nugent’s Corner. A  
5 major lahar along the Nooksack would divert the river from its channel and cause  
6 mass flooding. Fortunately, volcanic eruptions are infrequent with periods of  
7 hundreds and thousands of years between events, but this infrequency also makes  
8 forecasting a volcanic eruption extremely difficult. However, a major eruption of Mt.  
9 Baker would pose a serious threat to human life and property. The deeply  
10 weathered nature of the rocks forming Mt. Baker may also fail, triggering a  
11 mudflow that would travel rapidly down the stream channels ringing the volcano  
12 and result in damage similar to that from a volcanic eruption trigger. Mapping over  
13 the past decade of other Cascade volcanoes has demonstrated massive mudflows  
14 extending from the volcanoes to Puget Sound, and from Mount Rainier and Glacier  
15 Peak.

16 **Earthquake Hazards** – Whatcom County lies within the influence of the  
17 convergent plate margin between the Pacific and North American Plate termed the  
18 Cascadia Subduction Zone. Regionally-extensive and damaging earthquakes,  
19 termed mega-thrusts, are possible when stress generated between the subducting  
20 Pacific Plate and over-riding North American Plate is released. A mega-thrust  
21 earthquake is capable of generating an earthquake of magnitude 9, or greater, and  
22 research has indicated an approximate recurrence interval of 500-600 years.  
23 Associated with the stresses generated at the convergent plate margin are shallow,  
24 crustal faults that are mapped throughout Whatcom County. Earthquake activity on  
25 these fault systems is much more frequent than that observed at the Cascadia  
26 Subduction Zone, and the Deming area is considered one of the most seismically  
27 active areas in Washington. Recent research has shown these crustal faults are  
28 capable of generating a magnitude 7 earthquake with an average recurrence  
29 interval of 30 to 50 years. While all buildings are susceptible to damage from  
30 seismic-shaking, structures built on peat soils, large areas of non-structural fill, or  
31 liquefiable soils are prone to more severe shaking during an earthquake. If the  
32 shaking is strong enough, or of sufficient duration, structures may collapse or  
33 become damaged due to building fatigue, ground settlement/liquefaction, and/or  
34 lateral spreading. In addition to seismic hazards posed by the Cascadia Subduction  
35 Zone, a significant mega-thrust earthquake has the potential to generate a large  
36 and destructive tsunami that has the potential to affect most low-bank areas of the  
37 County.

38 **Mine Hazards** – Mine hazard areas are sites of abandoned underground mine  
39 shafts, adits, and mine tailings. Coal mining was a major industry in Whatcom  
40 County in the early part of the 20<sup>th</sup> century, and several major mines were  
41 developed in various parts of the county. All of the formerly active mines are now  
42 no longer worked and are abandoned. For the most part these mine locations are  
43 known and mapped, such as the extensive coal mines under the northern part of  
44 the City of Bellingham and in the Blue Canyon area of South Lake Whatcom.

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1 **Issues, Goals, and Policies**

2 **Landslides** – Siting human development on or adjacent to known landslide hazard  
3 areas can create health and safety risks. The risks can be elevated due to extreme  
4 weather events and earthquakes, but may also occur with little or no warning. In  
5 the case of the Swift Creek Landslide, the release of asbestos-laden sediment poses  
6 an additional risk to public health. Development activity can de-stabilize naturally  
7 unstable slopes and impact ecosystems. However, predicting the exact timing,  
8 location, or extent of a damaging landslide is difficult, and in particular areas of the  
9 county landslide hazards are not possible to completely mitigate or avoid. In some  
10 circumstances, the development of upland properties may place downslope  
11 neighbors and ecosystems at risk from rockfall or landslides. A similar relationship  
12 holds true for development at the toe of a potentially unstable slope. In either  
13 event, development in proximity to landslide hazards must proceed in consideration  
14 of potential impacts in order to ensure life safety and preserve and protect public  
15 and private infrastructure.

16 **Alluvial Fans** – Because alluvial fan areas are associated with streams, are  
17 generally gently sloping and elevated above the adjacent floodplain, and are  
18 located at the base of mountains, they have historically been popular places to  
19 develop. However, once every 10-25 years, a large storm event occurs in our area  
20 and streams flood homes and developments, causing damage to property,  
21 ecosystems, and sometimes loss of lives.

22 **Flooding** – Floodwaters from the Nooksack River can damage homes, agricultural  
23 areas, businesses, and industries in the small cities situated along the river; fish  
24 and wildlife habitat and other ecosystems; and disrupt transportation and utility  
25 corridors. Storm tides can flood homes and roads along low, exposed marine  
26 shorelines in the Birch Bay, Sandy Point, Point Roberts, and Gooseberry Point  
27 areas. Homes along Lake Whatcom, Lake Samish, and Cain/Reed Lakes have also  
28 been impacted by flooding during extreme storm events. Property and public safety  
29 are also impacted by rapid channel morphology events.

30 **Volcanos** – A volcanic eruption or mudflow at Mount Baker could potentially  
31 severely affect river flow on the Nooksack River or Baker River and cause severe  
32 property damage near the volcanoes or along lahar routes. A lahar is an extremely  
33 rare and unpredictable occurrence. Evacuation routes should be planned and made  
34 public. Development should be regulated according to the Critical Areas Ordinance.

35 **Earthquakes** – A major earthquake may likely and significantly affect Whatcom  
36 County. If the shaking is strong enough, buildings may collapse, roads could be  
37 damaged, and/or communications, power, and utilities could be severely disrupted,  
38 mud and rock slides could occur on unstable slopes, and local sea levels may  
39 change as shorelines assume altered post-quake elevations.

40 **Mines** – Some abandoned mine areas may pose a risk of ground subsidence from  
41 the collapse of abandoned mine shafts. Air and water pollution may also be hazards  
42 associated with abandoned mine tailings and trapped toxic gases. Development on  
43 or near mine hazards could be adversely impacted.

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1 **Gas wells** – Several exploratory oil & gas wells have been drilled around the  
2 county over the last 70+years. Some of these present potential environmental  
3 hazards due to ongoing leakage of gas.

4 **Old Landfills** – There are known abandoned landfills in the County and possibly  
5 some that are unknown. There are also several sites around the County that  
6 contain large numbers of abandoned vehicles and other debris. As with most  
7 landfills these locations pose some degree of risk of hazardous substances leaking  
8 into local aquifers.

9 **Balanced Management** – A central issue common to all development in natural  
10 hazard areas is the need for Whatcom County to balance the responsibility of local  
11 government to protect the public interest and provide for a safe and healthy  
12 environment while safeguarding the rights of private property owners.

13 **Economic Impact** – Damage to private and public property resulting from the  
14 siting of human development in areas of natural hazards is significant to the people  
15 of Whatcom County. The 1990 Nooksack River floods caused over \$20 million  
16 dollars in damage to roads, bridges, buildings, and farmland. Disaster relief efforts  
17 are expensive and dangerous to conduct during an emergency. Public efforts to  
18 reduce hazards, such as the establishment of the Flood Control Zone District, are  
19 also expensive.

20 **Goal 10E:** **Minimize potential loss of life, damage to property, the**  
21 **expenditure of public funds, and degradation of**  
22 **ecosystems resulting from development in hazardous**  
23 **areas such as floodplains, landslide-prone areas, seismic**  
24 **hazards areas, volcanic impact areas, abandoned mine**  
25 **and exploratory gas well locations, potentially dangerous**  
26 **alluvial fans, and other known natural hazards by**  
27 **advocating the use of land acquisition, open space**  
28 **taxation, conservation easements, growth planning,**  
29 **regulations, and other options to discourage or minimize**  
30 **development, or prohibit inappropriate development in**  
31 **such areas.**

32 Policy 10E-1: Avoid or minimize public investments for future infrastructure  
33 development on known natural hazard areas.

34 Policy 10E-2: Use Best Available Science and data to research and investigate  
35 the nature and extent of known natural hazards in the county  
36 and make this information available to the general public and  
37 policy makers in an accessible and understandable form.

38 Policy 10E-3: Broadly inform the people of Whatcom County of the locations  
39 of known natural hazards, and the potential for adverse impacts  
40 of such natural hazards to the health, safety, and welfare of  
41 people and their properties.

42 Policy 10E-4: Establish acceptable levels of public risk for development in  
43 known natural hazard areas based upon the nature of the  
44 natural hazard and levels of public risk, and maintain regulatory

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- 1 criteria for approving, disapproving, conditioning, or mitigating  
2 development activity.
- 3 Policy 10E-5: Prohibit the siting of critical public facilities in known natural  
4 hazard areas unless the siting of the facility can be shown to  
5 have a public benefit that outweighs the risk of siting in the  
6 particular hazard area.
- 7 Policy 10E-6: Maintain a comprehensive program of regulatory and non-  
8 regulatory mechanisms to achieve Natural Hazard goals and  
9 policies. This program should include such mechanisms as  
10 education, tax incentives, zoning, land use regulations,  
11 conservation easements, purchase of development rights,  
12 transfer of development rights, and public acquisition.
- 13 Policy 10E-7: Be consistent with the Natural Hazard goals and policies and  
14 consider the locations of Natural Hazard Areas when establishing  
15 or changing zoning patterns and densities.
- 16 Policy 10E-8: To address the causes of flooding and avoid expensive and  
17 maintenance-intensive bank protection measures, the County  
18 should prioritize its floodplain property acquisition program.
- 19 Policy 10E-9: Discourage new development in the floodplain.
- 20 Policy 10E-10: Require applicants for development permits located in natural  
21 hazard areas to provide development plans designed to  
22 minimize the potential to exacerbate the natural hazard as well  
23 as the risk of damage to property or threats to human health  
24 and safety. In natural hazard areas where engineering solutions  
25 cannot be designed to withstand the forces expected to occur  
26 under the design event of a particular natural hazard, or off-site  
27 adverse impacts to adjacent properties or ecosystems cannot be  
28 adequately mitigated, Whatcom County may deny development  
29 permits intended for permanent or seasonal human habitation  
30 as described in the Critical Areas Ordinance.
- 31 Policy 10E-11: Consider conducting a public process with affected citizens,  
32 technical experts, and decision-makers to establish  
33 recommended levels of public risk for each of the identified  
34 natural hazards. In developing recommended levels of public  
35 risk for natural hazards, consider the appropriate variables  
36 affecting developments in hazardous areas. These variables may  
37 include:
- 38 • Specific types of risk associated with the particular hazard  
39 area;
  - 40 • The gradation of hazards associated with a particular geo-  
41 hazard;
  - 42 • Level of detail necessary to map hazard areas;

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- 1 • Different levels of risk associated with different ownership  
2 classes (e.g. public ownership versus private ownership);
  - 3 • Different levels of risk associated with different types of land  
4 uses; and,
  - 5 • Mitigation measures related to specific adverse impacts of  
6 development in hazard areas.
- 7 Once a set of risk levels has been identified, propose these risk  
8 levels for adoption of legislation by the County Council as the  
9 level to which future development must be designed.
- 10 Policy 10E-12: Consider establishing acceptable levels of public risk for use in  
11 approving and conditioning development activity in known  
12 natural hazard areas. The established level of risk may be  
13 expressed as the potential hazard posed as determined by  
14 scientific and historical methods applicable to each specific  
15 natural hazard.
- 16 Policy 10E-13: Review the findings and recommendations of alluvial fan hazard  
17 evaluations and make appropriate recommendations for land  
18 use and zoning regulations to the County Council to assist in  
19 reducing the hazards posed on these fans. Whatcom County has  
20 completed or nearly completed alluvial fan evaluations of  
21 Canyon Creek, Jones Creek, and Glacier-Gallop Creeks.
- 22 Policy 10E-14: Review the findings and recommendations of the  
23 Comprehensive Flood Hazard Management Plan (CFHMP) and  
24 make appropriate recommendations for land use and zoning  
25 regulations to the County Council to assist in the  
26 implementation of the CFHMP.
- 27 Policy 10-15E: Identify known locations of abandoned wells that could produce  
28 methane and/or other hazardous substances and where  
29 immediate danger of methane and hazardous substance leaking  
30 exists, condition development approvals on affected parcels to  
31 mitigate those impacts.

32 **Water Resources**

33 **Introduction**

34 Water resources refer to the numerous surface waters such as lakes, streams,  
35 wetlands; groundwater; estuaries; and marine waterbodies within Whatcom County  
36 (**Map 10-1**). These waterbodies are often integrally linked through the complex  
37 network referred to as the water cycle. The water cycle describes the series of  
38 transformations that occur in the circulation of water from the atmosphere onto the  
39 surface and into the subsurface regions of the earth, and then back from the  
40 surface to the atmosphere. Water resources of Whatcom County provide: natural  
41 beauty; recreation; habitat for fish and wildlife; water for drinking, agriculture, and  
42 industry; and other benefits essential to the quality of life and economic health of



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1 the community. The quality of life and economic health of our county's communities  
2 depend on the maintenance of a safe and reliable water supply. Decisions affecting  
3 any element of the water environment must be based on consideration of the  
4 effects on other elements.

5 **Background Summary**

6 Whatcom County has 16 major freshwater lakes, 3,012 miles of rivers and streams,  
7 over 37,000 acres of wetlands, 134 miles of marine shoreline, and aquifers  
8 containing an undetermined amount of groundwater. These water resources serve  
9 multiple uses, including providing a source of drinking water for the people of  
10 Whatcom County. Surface water sources such as Lake Whatcom, the Nooksack  
11 River, and Lake Samish provide water to more than half the county residents, with  
12 the remainder relying on groundwater, either from individual wells or from about  
13 300 public water systems. Agriculture relies on both ground and surface water for a  
14 variety of uses, including irrigation and drinking water for livestock. Businesses and  
15 industries may also require water, sometimes in substantial quantities, from non-  
16 potable and potable supplies. Water is also essential to meet many of what are  
17 referred to as "instream" uses, such as recreation, shellfish growing and harvesting,  
18 fish and wildlife habitat, aesthetics, and other uses and benefits.

19 Groundwater is contained in aquifers, which are subterranean layers of porous rock  
20 or soil. Most of the surficial aquifers in Whatcom County are replenished by  
21 rainwater. Aquifers are often integrally linked with surface water systems and are  
22 essential for meeting instream and out-of-stream water needs such as for drinking  
23 water, agriculture, industry, and other uses.

24 Rainfall that runs into drainage courses such as ditches, streams, wetlands, rivers,  
25 lakes, and the Strait of Georgia supports local surface and marine waters. Natural  
26 drainage systems have many important functions, including storing excess water  
27 flow, purifying surface water, recharging groundwater, conveying water, and  
28 supporting important biological activities. As more areas in Whatcom County are  
29 being urbanized, natural water resource systems are being replaced with built  
30 systems, leading to permanent changes in hydrology.

31 Whatcom County government has a major role in helping to maintain these benefits  
32 through its many responsibilities and programs, particularly in the areas of health,  
33 safety, land use, and development. The intent of the following goals and policies is  
34 to provide guidance to Whatcom County government as it assists its citizens in  
35 effectively managing our water resources in a manner that ensures that the  
36 benefits of those resources are maintained far into the future. The water resource  
37 section focuses primarily on groundwater and surface water management. Surface  
38 water management relates generally to watershed protection and stormwater/  
39 drainage systems. However, some policy direction may indirectly be provided for  
40 areas such as wetlands, estuaries, streams, and marine waterbodies within the  
41 Water Resource section. Some of these areas are covered in more detail in other  
42 sections within the Environment Chapter.

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### 1 **Whatcom County Water Resource Programs**

2 Whatcom County has and/or participates in numerous water resource programs  
3 aimed at protecting and enhancing water quality and quantity, including:

- 4 • WRIA 1 Watershed Management Project;
- 5 • Lake Whatcom Watershed Management;
- 6 • Groundwater Protection & Management;
- 7 • Flood Hazard Management; and,
- 8 • Stormwater Management.

### 9 **WRIA 1 Watershed Management Project**

10 The WRIA 1 Watershed Management Project is the result of the 1998 Washington  
11 State Watershed Management Act, which required all participating local  
12 governments to address water quantity, with the option of addressing water  
13 quality, instream flows, and fish habitat. The WRIA 1 Watershed Management  
14 Project has brought together citizens, local governments, tribes, and state and  
15 federal agencies to address these issues.

16 The framework for watershed management in the state is based on geographic  
17 areas known as Water Resource Inventory Areas (WRIAs). WRIA 1 includes the  
18 Nooksack River basin and several adjoining smaller watersheds, such as the coastal  
19 drainages of Dakota and California Creeks, as well as Lake Whatcom.

20 Watershed planning in WRIA 1 started in 1998 with the signing of a Memorandum  
21 of Agreement (MOA) between the *Initiating Governments*. In the WRIA 1 the  
22 Initiating Governments are Whatcom County, City of Bellingham, Public Utility  
23 District No. 1, Lummi Nation, and Nooksack Tribe (the latter joining slightly later  
24 through a Letter of Agreement). The role of the Initiating Governments was to  
25 review a recommended Watershed Plan and take it to their governments' councils  
26 for adoption.

### 27 Historical Organization (1999-2016)

#### 28 *WRIA 1 Joint Board*

29 In 1999, an Interlocal Agreement further formalized the government-to-  
30 government relationship essential to the tribes' participation in the process by  
31 creating a *Joint Board*. The Joint Board is comprised of the Initiating Governments,  
32 including the mayor of the City of Bellingham, executive for Whatcom County,  
33 manager of Public Utility District No. 1, and designated policy representatives of  
34 Lummi Nation and Nooksack Tribe. The Board manages the project's administrative  
35 functions such as contracts and budgets. Members of the Joint Board also sit on the  
36 Joint Policy Boards.

#### 37 *WRIA 1 Joint Policy Boards*

38 The WRIA 1 Joint Policy Boards are comprised of members of the WRIA 1 Joint  
39 Board and Salmon Recovery Board. This organizational level interacts with federal,  
40 state, and regional organizations at a policy-level to coordinate the implementation

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1 and management of the WRIA 1 Watershed Management Plan – Phase 1, the WRIA  
2 1 Salmonid Recovery Plan and other related activities.

### 3 *Local Integrating Organization (LIO)*

4 The Whatcom Local Integrating Organization (LIO) is a function of the WRIA 1  
5 Watershed Joint Board and WRIA 1 Salmon Recovery Board (Joint Policy Boards).  
6 Local integrating organizations are designated by the Puget Sound Partnership. The  
7 two WRIA 1 Boards accepted the function of the Whatcom LIO in October 2010  
8 under the integrated program structure, and was officially recognized by the Puget  
9 Sound Partnership's Leadership Council in November 2010. The purpose of the  
10 Whatcom LIO is to coordinate implementation of Puget Sound Action Agenda  
11 priorities that are consistent with or complement local priorities. One of its functions  
12 is to provide a local update to the Action Agenda for Puget Sound. Local updates  
13 are intended to identify local priorities in the form of near-term actions (NTAs),  
14 which are priority actions with measurable outcomes that can be implemented in  
15 the next two years and that align with strategies in the Action Agenda for Puget  
16 Sound.

### 17 *WRIA 1 Planning Unit*

18 The Initiating Governments established the Planning Unit to ensure representation  
19 of a broad range of water resource interests. The Planning Unit's role is to  
20 recommend actions for a Watershed Plan and to contribute knowledge, interests,  
21 technical expertise, and other resources to its development. The Planning Unit is  
22 made up of representatives from the Initiating Governments, other governments,  
23 and various caucuses. There are 16 total caucuses on the WRIA 1 Planning Unit.

### 24 *Organizational Update (2016)*

25 Through an interlocal agreement entered into in 2016, the Watershed Management  
26 Project Joint Board and the WRIA 1 Salmon Recovery Board were dissolved and the  
27 duties and functions of those boards were assumed by the new WRIA 1 Watershed  
28 Management Board, consisting of one representative from the Lummi Nation, the  
29 Nooksack Tribe, the Washington State Department of Fish and Wildlife, Whatcom  
30 County, Whatcom County PUD No. 1, and the cities of Bellingham, Blaine, Everson,  
31 Ferndale, Lynden, Nooksack, and Sumas.

32 The primary functions of the WRIA 1 Watershed Management Board are to:

- 33 • Facilitate implementation and adaptive management of the WRIA 1  
34 Watershed Management Plan-Phase 1 as currently constituted or  
35 subsequently amended;
- 36 • Coordinate the implementation and adaptive management of the WRIA 1  
37 Salmonid Recovery Plan and associated implementation documents,
- 38 • Serve as the WRIA 1 Salmon Recovery Lead Entity pursuant to RCW 77.85,
- 39 • Coordinate participation in Puget Sound salmon recovery efforts,
- 40 • Coordinate the development, implementation and adaptive management of  
41 WRIA 1 watershed chapters of recovery plans for ESA listed salmonids and  
42 other salmonid species as warranted;

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- 1 • Coordinate planning, implementation, monitoring and adaptive management  
2 of ecosystem recovery actions in WRIA 1 consistent with agreed local goals  
3 and objectives,  
4 • Serve as the WRIA 1 Local Integrating Organization and a partner in the  
5 Puget Sound Partnership in representing WRIA 1 goals and priorities; and  
6 • Participate in other related activities as agreed to by the Board.
- 7 The roles of the Local Integrating Organization and Planning Unit did not change.
- 8 2005 WRIA 1 Watershed Management Plan – Phase 1
- 9 The 2005 WRIA 1 Watershed Management Plan was approved in 2005 by the Joint  
10 Administrative Board, Planning Unit (by consensus), and the County Council.  
11 Pursuant to subsequent state requirements, a WRIA 1 Watershed Detailed  
12 Implementation Plan was approved by the Joint Administrative Board, Planning  
13 Unit, and County Council in 2007. It provides a roadmap for addressing water  
14 quantity, water quality, instream flow, and fish habitat challenges. The goals of the  
15 WRIA 1 Watershed Management Project are: water of sufficient quantity and quality  
16 to meet the needs of current and future human generations; restoration of salmon,  
17 steelhead, and trout populations to healthy harvestable levels; and the  
18 improvement of habitats on which fish and shellfish rely. These goals are addressed  
19 more specifically below:
- 20 • **Water Quantity** – To assess water supply and use, and develop strategies  
21 to meet current and future needs. The strategies should retain or provide  
22 adequate amounts of water to protect and restore fish habitat, provide water  
23 for future out-of-stream-uses, and ensure adequate water supplies are  
24 available for agriculture, energy production, and population and economic  
25 growth under the requirements of the state’s Growth Management Act.
- 26 • **Water Quality** – To ensure the quality of our water is sufficient for current  
27 and future uses, including restoring and protecting water quality to meet the  
28 needs of salmon and shellfish, recreational uses, cultural uses, protection of  
29 wildlife, providing affordable and safe domestic water supplies, and other  
30 beneficial uses. The initial objectives of the water quality management  
31 strategy will be to meet the water quality standards.
- 32 • **Instream Flow** – To supply water in sufficient quantities to restore salmon,  
33 steelhead, and trout populations to healthy and harvestable levels and  
34 improve habitats on which fish rely.
- 35 • **Fish Habitat** – To protect or enhance fish habitat in the management area  
36 and to restore salmon, steelhead, and trout populations to healthy and  
37 harvestable levels and improve habitats on which fish rely.
- 38 In 2010, the WRIA 1 Joint Board adopted a work plan, budget, and financing  
39 strategy, called the Lower Nooksack Strategy, to advance a negotiated settlement  
40 of Tribal and state instream flow water rights on the mainstem of the Nooksack  
41 River, while maximizing the economic and environmental benefits of out-of-stream  
42 water use in the Lower Nooksack sub-basin. The Joint Board adopted the Lower  
43 Nooksack Strategy consistent with WRIA 1 Watershed Management Plan priorities.

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- 1 Lower Nooksack Strategy Objectives:
- 2 • Develop and implement a process for negotiating settlement of water rights
- 3 on the Mainstem Nooksack River.
- 4 • Update and verify the Lower Nooksack River sub-basin water budget and
- 5 develop a groundwater model.
- 6 • Determine out-of-stream water user needs:
- 7 o Public water system needs determined by updated the Whatcom County
- 8 Coordinated Water System Plan (CWSP).
- 9 o Other out-of-stream user needs (e.g., agriculture, private domestic wells,
- 10 industrial, etc.) determined through a regional water supply planning
- 11 process.
- 12 • Continue and, if appropriate, enhance targeted streamflow and water quality
- 13 sampling.
- 14 • Advance work on tools that foster water resource allocations consistent with
- 15 long-term economic and environmental land-use goals for implementation in
- 16 five years.

17 Streamflow Restoration Act (ESSB 6091)

18 The Streamflow Restoration Act (ESSB 6091), enacted by the Washington State

19 Legislature on January 18, 2018 and effective on January 19, 2018, directs the

20 Department of Ecology to work with the initiation governments (i.e., the WRIA I

21 Watershed Management Board), in collaboration with the planning unit established

22 pursuant to chapter 90.82 RCW, on updating the WRIA 1 Watershed Management

23 Plan for approval by the Whatcom County Council by February 1, 2019.

24 The Act requires that the updated plan include recommendations for projects and

25 actions that will measure, protect, and enhance instream resources and improve

26 watershed functions that support the recovery of threatened and endangered

27 salmonids. Such recommendations may include, but are not limited to, acquiring

28 senior water rights, water conservation, water reuse, stream gaging, groundwater

29 monitoring, and developing natural and constructed infrastructure, which includes,

30 but is not limited to, such projects as floodplain restoration, off-channel storage,

31 and aquifer recharge. Qualifying projects must be specifically designed to enhance

32 streamflows and not result in negative impacts to ecological functions or critical

33 habitat.

34 At a minimum, the watershed plan must include those actions determined to be

35 necessary to offset potential impacts to instream flows associated with permit-

36 exempt domestic water use. The highest priority recommendations must include

37 replacing the quantity of consumptive water use during the same time as the

38 impact and in the same basin or tributary. Lower priority projects include projects

39 not in the same basin or tributary and projects that replace consumptive water

40 supply impacts only during critical flow periods. The watershed plan may include

41 projects that protect or improve instream resources without replacing the

42 consumptive quantity of water where such projects are in addition to those actions

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1 determined to be necessary to offset potential consumptive impacts to instream  
2 flows associated with permit-exempt domestic water use.

3 Until the updated watershed plan is approved and rules are adopted by the  
4 Department of Ecology, the County, in issuing building permits under RCW  
5 19.27.097(1)(c) or approving subdivisions under chapter 58.17 RCW in WRIA 1, will  
6 comply with all of the specific requirements of ESSB 6091.

**7 Lake Whatcom Watershed Management**

8 Lake Whatcom is a large multi-purpose reservoir that is the source of drinking  
9 water for the City of Bellingham, Lake Whatcom Water and Sewer District, several  
10 other smaller water districts/associations, and about 250 homes that draw water  
11 directly from the lake. The lake provides water to about half the population of  
12 Whatcom County.

13 Lake Whatcom is a multiple use lake and watershed. In addition to providing water  
14 for drinking, commercial, and industrial uses, the lake is used for boating,  
15 swimming, and fishing. The majority of the watershed is forested, mainly  
16 surrounding the large southernmost portion of the lake. Other land uses include  
17 residential development (approximately 5,300 homes are located within the  
18 watershed), limited agriculture and commercial development, parks, and other  
19 public facilities. The on-going management challenge is trying to determine the  
20 extent to which these practices can occur while maintaining safe, clean drinking  
21 water. The challenge is further complicated by possible requirements related to the  
22 Endangered Species Act, tribal water rights, and the potential impact these issues  
23 may have on how the City's diversion from the Nooksack River is operated.

24 The watershed contains four developed areas: the City of Bellingham, which  
25 straddles the upper portion of the northern-most basin of the lake; Geneva, which  
26 is immediately south and east of Bellingham's city limits and is part of the city's  
27 urban growth area; Hillsdale, which is immediately north and east of Bellingham's  
28 city limits and is also part of the city's urban growth areas; and the Sudden Valley  
29 Rural Community. In addition, it includes a variety of other zones, including  
30 resource, rural, and residential rural zones. Outside the Bellingham City limits,  
31 approximately 70% of the watershed is in Forestry zoning and more than 75% of  
32 the current land use is forestry.

33 Water and sewer service are provided by the Lake Whatcom Water and Sewer  
34 District. Capacity problems in the district's sewer line, which serves Geneva and  
35 Sudden Valley, have caused overflows into the lake in the past. An aggressive  
36 program to preclude stormwater infiltration has reduced the overflow problems to a  
37 large extent. In addition, the district has a contractually limited flow capacity to  
38 Bellingham. The Lake Louise Road sewage interceptor was constructed in January  
39 2003 to carry waste water from Sudden Valley and Geneva and serves as a  
40 complement to the Lake Whatcom Boulevard trunk line. The interceptor was  
41 designed to service full build-out of Sudden Valley and Geneva.

42 The City of Bellingham and Lake Whatcom Water and Sewer District are responsible  
43 for ensuring drinking water standards are met for their customers. To date water  
44 supplies have consistently met standards. The ability to continue to economically

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1 meet drinking water standards requires maintaining source water that requires  
2 minimal treatment. For this reason the City of Bellingham maintains an on-going  
3 source water-monitoring program. Other agencies including Western Washington  
4 University, Department of Natural Resources, Department of Fish and Wildlife,  
5 Department of Ecology, Lake Whatcom Water and Sewer District, and Whatcom  
6 County, have also conducted monitoring, studies, and/or evaluations of the lake  
7 and watershed.

8 Studies on Lake Whatcom conducted over a number of years indicate water quality  
9 in the lake has declined. In 1998, the Washington State Department of Ecology  
10 listed Lake Whatcom as an impaired water body and placed Lake Whatcom on the  
11 Federal Clean Water Act 303(d) list because of low oxygen levels in the Lake and  
12 high bacteria levels in streams that flow into the Lake. The 303(d) listing requires  
13 the establishment of a Total Maximum Daily Loads (TMDLs). The Department of  
14 Ecology issued the “Lake Whatcom Watershed Total Phosphorus and Bacteria Total  
15 Maximum Daily Loads: Volume 1, Water Quality Study Findings” in 2008. This study  
16 documented Lake Whatcom is impaired for dissolved oxygen due to phosphorus  
17 loading and that streams flowing into Lake Whatcom do not meet fecal coliform  
18 bacteria standards. Loading capacities for total phosphorus and bacteria reduction  
19 targets were set forth in this document. In 2013 The Department of Ecology issued  
20 a draft “Lake Whatcom Watershed Total Phosphorus and Bacteria Total Maximum  
21 Daily Loads: Volume 2, Water Quality Improvement Report and Implementation  
22 Strategy.” This report identifies how much phosphorus can be discharged to the  
23 Lake and identifies how the bacteria load should be allocated between the County  
24 and City of Bellingham, in order to meet water quality standards.

25 A significant cause of declining oxygen levels has been from residential  
26 development in the watershed. Past development permitted by the City of  
27 Bellingham and Whatcom County has led to increased phosphorus loading into the  
28 lake, which stimulates algae growth. Bacteria that consume the dying algae deplete  
29 the dissolved oxygen, leading to lower oxygen levels in the lake. Past poorly  
30 managed forest practices may have led to significant increases in phosphorus  
31 loading to the lake.

32 Whatcom County has taken a number of actions to reduce phosphorus and  
33 otherwise address Lake Whatcom water quality. These include rezoning land to  
34 allow less development in the watershed, adoption of the Lake Whatcom  
35 Comprehensive Stormwater Management Plan, revising stormwater management  
36 standards for private development to significantly reduce potential phosphorus  
37 runoff, construction of stormwater capital improvement projects and adoption of  
38 regulations that restrict the application of commercial fertilizers.

39 In 2014, approximately 8,800 acres of forest lands around Lake Whatcom were  
40 transferred to Whatcom County from the Washington Department of Natural  
41 Resources through reconveyance. These lands will provide passive recreation  
42 opportunities with hiking and biking trails connecting various communities,  
43 neighborhoods, and parks throughout the watershed. Under County ownership, the  
44 forests will be allowed to mature to an older growth environment benefiting the  
45 watershed and helping to stabilize steep slopes that surround the lake.

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1 In 2004, the Department of Natural Resources (DNR) Board on Natural Resources  
2 adopted the Lake Whatcom Landscape Plan. This plan provides additional  
3 protections on remaining state managed lands within the Lake Whatcom watershed.  
4 The plan provides additional protections on streams and potentially unstable slopes  
5 not normally included in forest practices in Washington State.

### 6 Lake Whatcom Watershed Management Program

7 A variety of agencies, organizations, and individuals play a role in managing and  
8 protecting Lake Whatcom. In an effort to coordinate efforts of these various  
9 players, in 1990, the City of Bellingham, Whatcom County, and Water District 10  
10 (now known as the Lake Whatcom Water and Sewer District) began meeting to  
11 develop a joint management strategy for the Lake Whatcom watershed.

12 In November/December 1992, a joint resolution was passed by the Bellingham City  
13 Council, Whatcom County Council, and the Lake Whatcom Water and Sewer District  
14 (formerly Water District 10) Commissioners, which reaffirmed this position with six  
15 general goal statements and a set of specific goal statements in various categories.  
16 The specific goal statements for urbanization were the following:

- 17 • Prevent water quality degradation associated with development within the  
18 watershed.
- 19 • Review and recommend changes in zoning and development potential that  
20 are compatible with a drinking-water reservoir environment.
- 21 • In addition to zoning, identify and promote other actions to minimize  
22 potential for increased development in the watershed (i.e. land trust,  
23 development rights, cost incentives, etc.).
- 24 • Develop specific standards which reduce the impacts of urbanization, such as  
25 minimal lot clearing; clustered development to reduce infrastructure;  
26 collection and treatment of stormwater before entering the lake.
- 27 • Develop appropriate interlocal agreements with governing agencies to  
28 prohibit the potential for additional development once an agreed upon level is  
29 set.

30 The joint resolution included goals for watershed management that extended  
31 beyond urbanization. Goals were included for stormwater management, on-site  
32 waste systems, conservation, forest management, spill response, hazardous  
33 materials transport and handling, data/information management, education/public  
34 involvement, and other topics. A joint strategy was approved for developing specific  
35 plans to meet the adopted goals. Eight high priority goals were selected first and  
36 plans have been completed and jointly adopted for each of the goals.

37 In 1998, the City, County, and District 10 formalized their joint commitment to  
38 protect and manage the lake through the joint adoption of an interlocal agreement  
39 and allocation of funding toward protection and management efforts in the  
40 watershed. A five-year program plan was developed for ten program areas. Specific  
41 priority was placed on activities related to watershed ownership, stormwater  
42 management, and urbanization/land development.



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1 The resulting Lake Whatcom Management Program guides actions to protect Lake  
2 Whatcom as a long-term supply of drinking water for the City of Bellingham and  
3 portions of Whatcom County. The program emphasizes protection over treatment in  
4 managing Lake Whatcom and its watershed. The structure of the Lake Whatcom  
5 Management Program includes legislative bodies, a management team, an  
6 interjurisdictional coordinating team, agency staff, and advisory committees.

7 The Lake Whatcom Watershed Management Program website  
8 (<http://www.lakewhatcom.whatcomcounty.org/resources>) contains the management  
9 plans, reports, and work programs, as well as the jurisdictions' pertinent  
10 regulations and brochures on the different programs aimed at the various efforts to  
11 improve water quality.

### 12 Sudden Valley

13 Sudden Valley is a community within the Lake Whatcom Watershed. It was  
14 established in the early 1970s as a recreation/resort area but over the last thirty  
15 years has developed into a significant residential area.

16 Since 1985, Sudden Valley has mandated the use of appropriate stormwater best  
17 management practices through standards for individual stormwater detention for all  
18 new construction. Any new building permits on existing lots must be able to  
19 demonstrate that stormwater detention is included in the plan as a precondition to  
20 issuance of a permit. Sudden Valley is also subject to additional regulatory  
21 protections that apply to the Lake Whatcom Watershed under the Water Resource  
22 Protection Overlay District, Stormwater Special District, and Water Resource Special  
23 Management Area requirements. Under the provisions of these special districts,  
24 potential impacts from impervious surfaces, stormwater runoff, and clearing  
25 activities are required to be addressed either on-site or through a community-wide  
26 process.

### 27 **Groundwater Protection & Management**

28 Groundwater is contained in aquifers, which are subterranean layers of porous rock  
29 or soil. Most aquifers are replenished by rainwater, though some may contain water  
30 trapped during glacial periods. Aquifers are often integrally linked with surface  
31 water systems and are essential for meeting instream and out-of-stream water  
32 needs, such as for drinking water, agriculture, and industry. Whatcom County  
33 residents rely heavily on groundwater for drinking water, agriculture, and  
34 commercial and industrial needs. Groundwater also plays an important role in  
35 maintaining stream flows.

36 Many studies have been conducted related to groundwater quality in Whatcom  
37 County documenting water quality issues, such as exceedances of standards for  
38 nitrate, ethylene dibromide (EDB) and 1,2-dichloropropane (1,2-D), pesticides, iron  
39 and other agricultural-related contaminants, particularly in the northern portion of  
40 the County. In general, groundwater in Whatcom County is very vulnerable to  
41 contamination because much of the County's groundwater lies within a shallow  
42 unconfined aquifer. Activities that occur on the surface of the ground directly affect  
43 groundwater quality. Shallow wells that draw water from unconfined water table  
44 aquifers are at highest risk.

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1 Whatcom County's Critical Areas Regulations protect Critical Aquifer Recharge Areas  
2 (CARAs) during the development process, by precluding certain uses in CARAs  
3 and/or requiring certain precautions be taken in handling certain chemicals.

### 4 **Flood Hazard Management**

5 A comprehensive approach to flood hazard management planning provides a better  
6 understanding of the river and floodplain system. It also ensures flooding and  
7 channel morphology problems are not simply transferred to another location within  
8 the basin, but are addressed in a comprehensive, basinwide manner. This approach  
9 directs future flood hazard management expenditures in the most efficient and cost  
10 effective manner.

11 Whatcom County Public Works coordinates with the Flood Control Zone District  
12 Advisory Committee (FCZDAC) to identify and characterize flooding problems and  
13 provide recommendations for achieving consistent, long-term flood hazard  
14 reduction strategies. Some activities typically involved in developing a  
15 Comprehensive Flood Hazard Management Plan (CFHMP) include data collection,  
16 hydraulic modeling, alternatives analysis, floodplain mapping, and meander limit  
17 identification. In addition to the technical components in comprehensive flood  
18 planning, extensive coordination with the public and other agencies is required  
19 throughout the planning process.

20 Other County flood management programs include:

21 **Early Flood Warning** –Work with the United States Geological Survey (USGS)  
22 to maintain a network of early flood warning stations to help citizens prepare and  
23 take appropriate measures to protect lives and property from flood damages.

24 **Flood Hazard Reduction Program** – Implement projects to reduce future  
25 flood damages and public expenditures to repair damaged areas. Examples include  
26 construction of setback levees and overflow spillways, and designation of overflow  
27 corridors in overbank areas. Two alluvial fan studies have been completed for Jones  
28 Creek and Canyon Creek. For Jones Creek, review of potential mitigation measures  
29 and concept design of a preferred approach has also been completed.

30 **Comprehensive Flood Hazard Management Planning** – Identify flooding  
31 problems and provide recommendations for achieving long-term flood hazard  
32 reduction strategies. The Lower Nooksack River Comprehensive Flood Hazard  
33 Management Plan was adopted in 1999. Implementation of the plan is ongoing.

34 **Preparedness and Response** – Plan for and implement a coordinated  
35 response during flood events to ensure public safety and minimize flood damages.

36 **National Flood Insurance Program** – Participate in the Congress-initiated  
37 National Flood Insurance Program (NFIP) of 1968, to make affordable flood  
38 insurance available to citizens of communities that adopt approved flood  
39 management regulations.

40 **Repair and Maintenance Program** – Address problem areas with rivers,  
41 streams, and coastlines of Whatcom County, and mitigate future flood damages in a  
42 proactive and cost-effective manner.

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1     **Technical Assistance** – Provide technical assistance regarding drainage and  
2 flood issues to private citizens and businesses located along the many waterbodies  
3 within Whatcom County.

### 4     **Organization**

#### 5     Flood Control Zone District (FCZD)

6     Following the severe floods of 1989 and 1990, in 1992 Whatcom County created  
7 the countywide Flood Control Zone District (FCZD), including both incorporated and  
8 unincorporated areas of the County. The FCZD is a quasi-municipal corporation that  
9 is a separate legal entity from Whatcom County government. Even though this legal  
10 separation exists, the Whatcom County Council and the County Executive (Board of  
11 Supervisors) and the Public Works Department (staff) perform the governance and  
12 administrative support for the district.

13     The primary purpose of the FCZD is flood hazard management. Revenue generated  
14 to for this purpose is accomplished in two ways: (1) a county-wide uniformly  
15 applied tax; and, (2) supplemental revenue generated within localized Diking  
16 Districts and Sub-Flood Districts where specific local project activity is planned.

17     While the primary purpose of the FCZD is flood hazard management, the district is  
18 allowed to address a wide variety of water resource issues. Due to this ability,  
19 revenue generated by the district is currently used to finance additional water  
20 supply and water quality related improvement projects.

### 21     **Pertinent Documents**

#### 22     Lower Nooksack River Comprehensive Flood Hazard Management Plan (CFHMP)

23     In 1999, the county adopted the Lower Nooksack River Comprehensive Flood  
24 Hazard Management Plan (CFHMP). The CFHMP identifies projects, programs, and  
25 other recommendations aimed at reducing future flood damages along the Lower  
26 Nooksack River.

#### 27     Critical Areas Regulations (WCC 16.16)

28     Whatcom County's Critical Areas Regulations aim to protect people and property in  
29 Frequently Flooded Area (FFAs) by requiring development in these areas conforms  
30 to WCC Title 17, Flood Damage Prevention.

### 31     **Stormwater Management**

32     Stormwater runoff occurs when precipitation from rain or snowmelt flows over the  
33 land surface. The addition of roads, driveways, parking lots, rooftops, and other  
34 surfaces that prevent water from soaking into the ground greatly increases the  
35 runoff volume created during storms. This runoff is swiftly carried to our local  
36 streams, lakes, wetlands and rivers and can cause flooding and erosion.  
37 Stormwater runoff also picks up and carries with it many different pollutants that  
38 are found on paved surfaces, such as sediment, nitrogen, phosphorus, bacteria, oil  
39 and grease, trash, pesticides, and metals.

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**1 County Stormwater Management Programs**

**2 *National Pollutant Discharge and Elimination System (NPDES) Phase II Permit***

3 Stormwater runoff picks up pollutants as it travels over our developed landscapes  
4 and is a major source of water quality problems. In 1987, the Federal Clean Water  
5 Act was amended to address stormwater pollution. As a result, the United States  
6 Environmental Protection Agency (EPA) created the National Pollutant Discharge  
7 Elimination System (NPDES) to address stormwater runoff. States are required to  
8 administer permits to local jurisdictions to regulate runoff as part of the NPDES  
9 Program. The Permit is referred to as the "NPDES Phase II Permit" or "Phase II  
10 Municipal Stormwater Permit".

11 In February of 2007, the Washington State Department of Ecology issued Whatcom  
12 County's Phase II Municipal Stormwater Permit. This permit regulates discharges  
13 from Small Municipal Separate Storm Sewers, and is part of the National Pollutant  
14 Discharge and Elimination System (NPDES) and State Waste Discharge General  
15 Permit. It sets forth requirements of municipalities to address stormwater runoff in  
16 areas determined to have population densities reaching urban standards. Whatcom  
17 County is required to implement various stormwater management strategies to  
18 comply with this State permit.

19 The current Permit boundary covers approximately 15,000 acres and generally  
20 includes the following areas (Figure 1):

- 21 • Bellingham Urban Growth Area
- 22 • Sudden Valley
- 23 • Portions of the Hillsdale and Emerald Lake area
- 24 • Portions along North Shore Drive on Lake Whatcom and Lake Whatcom  
25 Boulevard
- 26 • Ferndale Urban Growth Area
- 27 • Portions along Chuckanut Drive and Chuckanut Bay
- 28 • Birch Bay Urban Growth Area

29 Additionally, though not within the NPDES permit area, the County has made the  
30 entire Lake Whatcom watershed is subject to the illicit discharge detection and  
31 elimination requirements of the Permit through ordinance and agreement with the  
32 Department of Ecology.

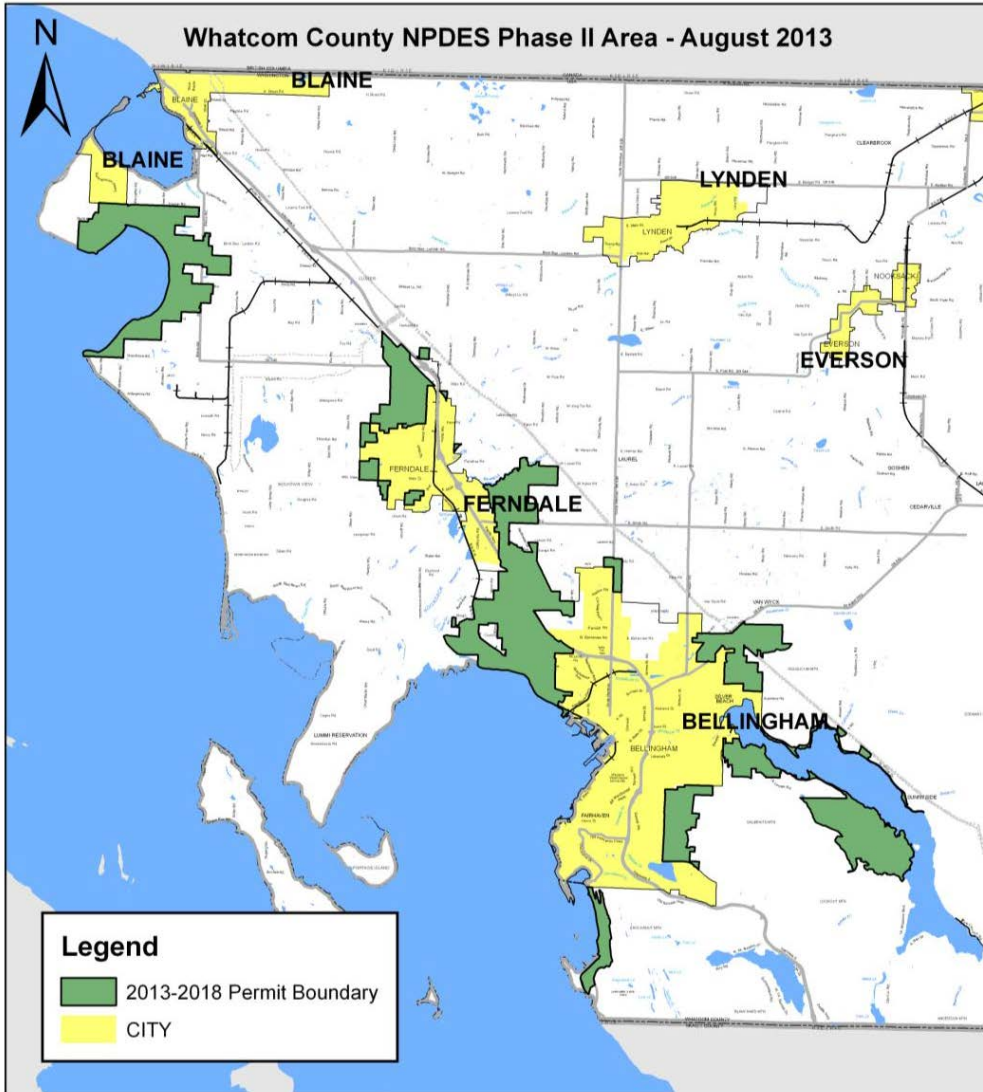
33 Jurisdictions are allowed to discharge runoff into waterbodies of the State (such as  
34 rivers, lakes, and streams) as long as they implement programs that protect water  
35 quality by reducing pollutants to the maximum extent possible through  
36 requirements of the NPDES Phase II Permit. Those requirements are reported and  
37 submitted to the Department of Ecology through the Stormwater Management  
38 Program (SWMP) and the Annual Compliance Report.

39 The Western Washington Phase II Municipal Stormwater Permit is required by the  
40 State of Washington Water Pollution Control Law Chapter 90.48 RCW, and the  
41 Federal Water Pollution Control Act Title 33 United States Code (Clean Water Act).  
42 The Permit is administered by the Washington State Department of Ecology.

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1  
2 **Figure 1. NPDES Phase II Boundaries**

3 *Pollution Identification and Correction (PIC) Program*

4 Clean water supports healthy drinking water, safe recreational uses, quality water  
5 for irrigation and livestock, healthy fish, and shellfish that are safe to consume.  
6 Currently, many streams in Whatcom County do not meet water quality standards  
7 for fecal coliform bacteria. Fecal coliform bacteria are found in the intestinal tract of  
8 warm-blooded animals and when found in streams are an indicator of human or  
9 animal waste in the water. The higher the bacteria level, the greater the public  
10 health risk to people drinking water, wading, fishing, or consuming shellfish. The

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1 Pollution Identification and Correction (PIC) Program was created to help implement  
2 community solutions to clean water.

3 **Pollution** – The key potential sources of bacteria that have been identified in  
4 Whatcom County coastal drainages are (1) **animal waste** from agricultural  
5 operations, domestic pets, waterfowl, and wildlife, and (2) **human sewage** from  
6 failing on-site sewage systems (OSS), leaking sewers, or cross-connections.

7 **Identification** – Whatcom County coordinates a routine water quality  
8 monitoring program at approximately 90 stations in watersheds that discharge to  
9 marine waters. Samples are collected on at least a monthly basis and analyzed for  
10 fecal coliform bacteria. Results are evaluated annually to identify focus areas with  
11 the largest bacteria problems. Within the focus areas, stream segments are  
12 monitored and potential bacteria sources are identified.

13 **Correction** – Technical and financial resources are offered to landowners to  
14 identify and implement solutions on their property. Residents can help improve the  
15 community's water quality by inspecting and maintaining septic systems and by  
16 fencing animals out of streams, ditches and swales. By actively managing pastures,  
17 creating protected heavy use areas, and covering manure storage areas, residents  
18 can prevent manure-contaminated mud from polluting surface water. Planting  
19 shrubs and trees along stream banks and picking up after dogs also contributes to  
20 better water quality.

21 **Issues, Goals, and Policies**

22 **Watershed Planning and Management**

23 **Goal 10F:** **Protect and enhance water quantity and quality and**  
24 **promote sustainable and efficient use of water resources.**

25 Policy 10F-1: Maintain as a high priority the protection of water quality and  
26 quantity.

27 Policy 10F-2: Actively participate in and support efforts to coordinate local,  
28 federal, tribal, and state agencies to achieve integration and/or  
29 consistency between the various levels of environmental  
30 regulations relating to the County.

31 Policy 10F-3: Work cooperatively with Federal, State, and local jurisdictions,  
32 Tribal governments, municipal corporations, and the public to  
33 implement the goals and policies of the Comprehensive Plan as  
34 well as state water resources and water quality laws.

35 Policy 10F-4: Participate in the coordination of all local water and land  
36 management efforts, plans, and data to ensure adequate  
37 oversight of water quantity and quality issues.

38 Policy 10F-5: Manage water resources for multiple instream and out-of-  
39 stream beneficial uses, including instream flows set by the State  
40 Department of Ecology.

41 Policy 10F-6: Actively promote and participate in education, research, and  
42 information opportunities that improve our understanding of the

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- 1 county's complex water resource systems. New information  
2 should be considered in the development and evaluation of  
3 management actions.
- 4 Policy 10F-7: Pursue the most effective methods for protecting water quantity  
5 and quality, through both regulatory (e.g. zoning, enforcement,  
6 fines) and non-regulatory approaches (education, incentives,  
7 and technical/financial assistance). Emphasis shall be placed on  
8 non-regulatory approaches where possible and effective.
- 9 Policy 10F-8: Track the development of policies and regulations at the local,  
10 state, and federal level. Provide input to those regulations and  
11 policies as necessary to ensure that the interests of Whatcom  
12 County are considered.
- 13 Policy 10F-9: In conjunction with all jurisdictions, develop and adopt  
14 programs to protect water quality and quantity within  
15 watersheds, aquifers, and marine waterbodies that cross  
16 jurisdictional boundaries.
- 17 Policy 10F-10: Promote awareness and participation in management and  
18 protection efforts by individual citizens and the community as a  
19 whole.
- 20 Policy 10F-11 Pursuant to ESSB 6091, Whatcom County will work through the  
21 **Planning Unit and** WRIA 1 Watershed Management Board and its  
22 established processes to update the WRIA 1 Watershed  
23 Management Plan, consistent with ESSB 6091, for approval by  
24 the Whatcom County Council by February 1, 2019. The updated  
25 plan shall include recommendations for projects and actions that  
26 will measure, protect, and enhance instream resources and  
27 improve watershed functions that support the recovery of  
28 threatened and endangered salmonids.
- 29 At a minimum, the watershed plan must include those actions  
30 determined to be necessary to offset potential impacts to  
31 instream flows associated with permit-exempt domestic water  
32 use. The highest priority recommendations must include  
33 replacing the quantity of consumptive water use during the  
34 same time as the impact and in the same basin or tributary.  
35 Lower priority projects include projects not in the same basin or  
36 tributary and projects that replace consumptive water supply  
37 impacts only during critical flow periods. The watershed plan  
38 may include projects that protect or improve instream resources  
39 without replacing the consumptive quantity of water where such  
40 projects are in addition to those actions determined to be  
41 necessary to offset potential consumptive impacts to instream  
42 flows associated with permit-exempt domestic water use.
- 43 Watershed plan recommendations may include, but are not  
44 limited to, acquiring senior water rights, water conservation,  
45 water reuse, stream gaging, groundwater monitoring, and

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1 developing natural and constructed infrastructure, which  
2 includes, but is not limited to, such projects as floodplain  
3 restoration, off-channel storage, and aquifer recharge.  
4 Qualifying projects must be specifically designed to enhance  
5 streamflows and not result in negative impacts to ecological  
6 functions or critical habitat.

7 Until the updated watershed plan is approved and rules are  
8 adopted, the County, in issuing building permits under RCW  
9 19.27.097(1)(c) or approving subdivisions under chapter 58.17  
10 RCW in WRIA 1 will comply with all of the specific requirements  
11 of ESSB 6091.

**Surface Water and Groundwater**

13 **Goal 10G:** **Protect and enhance Whatcom County's surface water**  
14 **and groundwater quality and quantity for current and**  
15 **future generations.**

16 Policy 10G-1: Manage surface water systems on a watershed basis.

17 Policy 10-2G: Coordinate efforts to bring all water users in Whatcom County  
18 into compliance with state and federal water laws in a way that  
19 enhances stream flows, water quality, and fish and wildlife  
20 habitat while advocating for adequate water for existing  
21 agriculture.

22 Policy 10G-3: In conjunction with the public and appropriate local, state,  
23 Tribal, and federal jurisdictions, define, identify, and develop  
24 management strategies for watershed basins and subbasins that  
25 may require special protection. These areas may include  
26 aquifers, critical aquifer recharge areas as defined under the  
27 Growth Management Act, Groundwater Management Areas,  
28 wellhead protection areas, and high priority watersheds such as  
29 those specified under WAC 400 (Local Planning and  
30 Management of Non-point Source Pollution), WRIA Watershed  
31 Management Planning, and under legislative policy direction  
32 (e.g. Nooksack Basin, Lake Whatcom, Lake Samish and Drayton  
33 Harbor).

34 Policy 10G-4: Management efforts should consider both water quality and  
35 quantity. Water quality efforts should help reduce the likelihood  
36 that potential contaminant sources will pollute water supplies.  
37 Water quantity efforts should include consideration and  
38 protection of recharge areas and potential effects on stream  
39 flow.

40 Policy 10G-5: Support the implementation of local and state Watershed  
41 Management Plans, the Lower Nooksack Strategy, the Lake  
42 Whatcom Management Program, NPDES Phase II Permitting,  
43 and the WRIA Watershed Management Projects.



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- 1 Policy 10G-6: Pursue the adoption and implementation of ground and/or  
2 surface water management plans and their integration into local  
3 comprehensive plans. Designate the Lake Whatcom and Lake  
4 Samish Watersheds as high priorities in this effort.
- 5 Policy 10G-7: Oppose the use of hydraulic fracturing in oil and gas wells (also  
6 known as “fracking”) to avoid the potential degradation of water  
7 quality in aquifers and other groundwater.
- 8 Policy 10G-8: Monitor, prevent, and reduce the establishment of invasive  
9 species in Whatcom County waterbodies.
- 10 Policy 10G-9: Identify and/or update wellhead protection areas and critical  
11 aquifer recharge areas and incorporate into the Critical Areas  
12 Ordinance. This information should be available to the public.

**13 Stormwater and Drainage**

**14 Goal 10H: Protect water resources and natural drainage systems by  
15 controlling the quality and quantity of stormwater runoff.**

- 16 Policy 10H-1: Manage stormwater runoff to minimize surface water quality and  
17 quantity impacts and downstream impacts on channel  
18 morphology, property owners, and aquatic species and habitats.
- 19 Policy 10H-2: Maintain or enhance, when appropriate, natural drainage  
20 systems and natural water storage sites in order to better  
21 protect water quality, moderate water quantity, minimize  
22 environmental degradation, and reduce public costs.
- 23 Policy 10H-3: Limit the alteration of natural drainage systems and natural  
24 water storage sites without mitigating measures. Such  
25 measures should not degrade water quality or fish and wildlife  
26 habitat and should not increase hazards to the community.
- 27 Policy 10H-4: Support the use by resource industries—such as agriculture,  
28 forestry, and mineral resource extraction—of management  
29 practices that minimize erosion and sedimentation, and  
30 significantly reduce pollutants.
- 31 Policy 10H-5: Evaluate the role of watersheds in the maintenance of water  
32 quality and quantity and determine what cumulative impacts  
33 development activity may have on watershed hydrology.
- 34 Policy 10H-6: Develop specific stormwater management programs for each  
35 drainage basin within the county's jurisdiction that may be  
36 impacted by urban levels of development. Recognize the Lake  
37 Whatcom Watershed, Lake Samish, and Drayton Harbor as high  
38 priorities in this effort. Coordinate efforts with the Lake  
39 Whatcom Policy Group, the various shellfish protection districts,  
40 and other watershed management entities.

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- 1 Policy 10H-7: Establish, as a high priority, a stormwater maintenance program  
2 that ensures that stormwater systems are adequately  
3 maintained and function at or near design capacity.
- 4 Policy 10H-8: Strongly incentivize the use of low impact development  
5 strategies. Minimize the amount of impervious surface whenever  
6 practicable by using natural engineering design methods such as  
7 the use of open, grassed, street swales and rain gardens instead  
8 of curbs and gutters. Where feasible, encourage alternate  
9 surfacing options and other techniques associated with low  
10 impact development (see Glossary).
- 11 Policy 10H-9: Develop and administer stormwater management standards as  
12 required by the NPDES Phase II Permit.
- 13 Policy 10H-10: Develop and administer regulations and incentives such that  
14 there is no net loss of ecological functions and values of  
15 regulated wetlands and fish and wildlife habitats.
- 16 Policy 10H-11: Place a high priority on integrating impervious surface reduction  
17 incentives into policies, regulations, and standards.
- 18 Policy 10H-12: Develop and implement comprehensive stormwater  
19 management programs and strategies designed to address  
20 runoff from all private and public developments and facilities  
21 within regulated and sensitive watersheds.
- 22 1. Implement the Western Washington Phase II Municipal  
23 Stormwater Permit as part of the National Pollutant  
24 Discharge Elimination System (NPDES) Program. Incorporate  
25 watershed considerations into the development of a  
26 comprehensive stormwater management strategy for  
27 designated areas.
- 28 2. Review Stormwater Special Districts Standards, Watershed  
29 Protection Districts, and other related codes that address  
30 runoff treatment from potentially polluting surfaces for their  
31 applicability to other sensitive watersheds with the Technical  
32 Advisory Committee and other appropriate agencies.  
33 Coordinate efforts for ongoing monitoring and evaluation  
34 within the sensitive watersheds and NPDES areas.
- 35 3. Amend subdivision, zoning, and other land use regulations  
36 and design standards to encourage that land use activities  
37 minimize the amount of impervious surface.
- 38 4. Identify and implement a long-term funding source to  
39 provide for water resource protection services, including non-  
40 point source identification and enforcement of applicable  
41 county regulations.
- 42 5. Focus on the Lake Whatcom watershed as a high priority in  
43 developing a stormwater management program. Develop a

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- 1 stormwater management plan that achieves a uniform level  
2 of protection throughout the Lake Whatcom watershed.  
3 Ensure coordination and communication with the public and  
4 affected jurisdictions, such as the Lake Whatcom Water and  
5 Sewer District, the Sudden Valley Community Association,  
6 and the City of Bellingham.
- 7 6. Ensure existing stormwater standards are adequately  
8 enforced within Stormwater Special Districts, Watershed  
9 Protection Districts, and the NPDES areas.
- 10 7. Prioritize stormwater polluting areas and develop retrofits for  
11 areas most likely to impact sensitive waters.

12 **Water Conservation**

13 **Goal 10-I: Support water conservation, reclamation, reuse**  
14 **measures, and education as a means to ensure sufficient**  
15 **water supplies in the future.**

16 Policy 10I-1: Support and assist water users in the development of cost-  
17 effective means of improving efficiency of water use.

18 Policy 10I-2: Support efforts to establish and protect sustainable water  
19 supplies to meet existing and future demands for water in the  
20 county.

21 Policy 10I-3: Develop and implement plans to comply with the Department of  
22 Ecology's instream flow and water management rules and water  
23 resources management programs.

24 Policy 10I-4: Coordinate local water and land management efforts, plans,  
25 and data to ensure adequate oversight of water quality and  
26 quantity issues.

27 Policy 10I-5: Quantify water use to promote conservation.

28 Policy 10I-6: Use water use data to encourage conservation and maintain  
29 availability of water for agriculture and instream flow.

30 Policy 10I-7: Encourage the Department of Ecology to provide flexibility in the  
31 application of the water relinquishment rule simultaneous with  
32 establishing a water bank/water exchange program in Whatcom  
33 County in cooperation with stakeholders.

34 **Lake Whatcom Watershed**

35 **Goal 10-J: Prioritize the Lake Whatcom watershed as an area in**  
36 **which to minimize development, repair existing**  
37 **stormwater problems (specifically for phosphorus), and**  
38 **ensure forestry practices do not negatively impact water**  
39 **quality. Provide sufficient funding and support to be**  
40 **successful.**

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- 1 Policy 10J-1: Work with property owners to find acceptable development  
2 solutions at lower overall densities than the present zoning  
3 allows.
- 4 Policy 10J-2: Develop and implement the fair and equitable funding  
5 mechanisms called for in the 2008 Lake Whatcom  
6 Comprehensive Stormwater Plan to support lake water quality  
7 protections by 2018.
- 8 Policy 10J-3: Recognize that all users of Lake Whatcom water have an  
9 interest in the resource and should share in the cost of its  
10 protection.
- 11 Policy 10J-4: Work cooperatively with the City of Bellingham, the Lake  
12 Whatcom Water and Sewer District, and applicable associations  
13 and organizations to identify, review, and, as appropriate,  
14 recommend changes to existing monitoring programs to better  
15 improve lake water quality.
- 16 Policy 10J-5: Evaluate and pursue, as appropriate, the use of incentives to  
17 encourage voluntary lot consolidation, transfer or purchase of  
18 development rights, current use taxation, and participation in  
19 open space conservation programs.
- 20 Policy 10J-6: Do not allow density bonuses within the Lake Whatcom  
21 Watershed.
- 22 Policy 10J-7: Work cooperatively with the City of Bellingham and the Lake  
23 Whatcom Water and Sewer District to develop and track  
24 benchmarks to determine: the effectiveness of management  
25 options; when goals have been achieved; and/or when  
26 additional actions are necessary.
- 27 Policy 10J-8: Continue to develop and refine structural and non-structural  
28 best management practices (BMPs), both voluntary and  
29 required, to minimize development impacts within the Lake  
30 Whatcom watershed.
- 31 Policy 10J-9: Work to keep publicly-owned forest lands within the Lake  
32 Whatcom watershed in public ownership, and support managing  
33 forestry on these lands in a manner that minimizes sediment  
34 and phosphorus yields from streams, and is consistent with Best  
35 Available Science (BAS) data, in order to protect and enhance  
36 water quality.
- 37 Policy 10J-10: Encourage the location of public services, such as schools,  
38 libraries, parks/open space, and post offices within Sudden  
39 Valley in an attempt to reduce the vehicle miles traveled within  
40 the watershed.
- 41 Policy 10J-11: Continue to work with Bellingham and Lake Whatcom Water and  
42 Sewer District to protect and manage the Lake Whatcom  
43 watershed in accordance with the 1998 jointly adopted interlocal

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- 1 agreement. Focus on continued implementation of the 5-Year  
2 Work Plans of the Lake Whatcom Management Program. In  
3 addition, work with the affected jurisdictions and secure funding  
4 for programs that protect and enhance water quality.
- 5 Policy 10J-12: Review and modify (as needed) the current development review  
6 process for projects in the Lake Whatcom Watershed to ensure  
7 coordination with other jurisdictions to streamline regulations  
8 that improve and protect water quality.
- 9 Policy 10J-13: The existence of sewer lines in the Rural and Rural Forestry  
10 comprehensive plan designations will not be used to justify  
11 rezoning property in the Lake Whatcom watershed to allow  
12 higher density land uses.
- 13 Policy 10J-14: Existing Urban Growth Areas shall not be ~~designated or~~  
14 expanded nor new Urban Growth Areas designated within the  
15 Lake Whatcom Watershed, and rezones that allow greater  
16 residential densities will not be allowed.

Comment [P/C3]: P/C struck

17 **Ecosystems**

18 **Introduction**

19 Ecological systems, or ecosystems, refer to the natural systems that have  
20 developed within the geologic and geographic setting of Whatcom County.  
21 Whatcom County contains a significant number of distinct ecosystem types, with  
22 associated fish, wildlife, and plant species, as well as many other living organisms.  
23 This biodiversity has evolved and adapted according to the specific physical and  
24 climatic conditions of the county (Map 10-2, Map 10-3). Ecosystem goals and  
25 policies are intended to provide guidance to county government as it assists people  
26 to manage and protect these ecosystems. Additionally they ensure other benefits  
27 are maintained far into the future.

28 **Background Summary**

29 Whatcom County provides a wide variety of natural habitats that support and  
30 shelter a diverse array of fish and wildlife species. The county's wildlife is  
31 particularly varied and abundant when compared to many other areas of  
32 Washington State. There are a number of factors that have contributed to this:  
33 abundant water resources, rich soils, mild climate conditions, and a moderate  
34 degree of urbanization are among the most important. Among the habitats of  
35 importance to fish and wildlife are the following:

- 36 • wetlands, lakes, and streams;
- 37 • nearshore, intertidal, estuarine habitats, and marine habitats including,  
38 but not limited to, kelp and eelgrass beds;
- 39 • riparian areas and other travel corridors;
- 40 • snags and downed logs;
- 41 • forested habitats in a variety of successional stages;

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- 1 • caves, cliffs, rocky balds, and talus slopes;
- 2 • grasslands and cultivated fields; and,
- 3 • thickets and fence rows.

4 Aquatic habitats include rivers, streams, ponds, lakes, and their riparian borders.  
5 Together, these habitats are essential to Whatcom County's fish and wildlife.  
6 Twenty-six species of fish—including twelve economically important stocks of  
7 salmon and trout—inhabit fresh water in Whatcom County for all or part of their life  
8 cycles. Healthy flowing streams and rivers, as well as off-channel wetland habitats,  
9 are essential to the survival of the majority of these fish. Wetland ponds, especially  
10 beaver ponds, provide optimal habitats for rearing and over-wintering of young  
11 fish, particularly Coho salmon and cutthroat trout juveniles.

12 Most wildlife species regularly use aquatic and riparian habitats for breeding,  
13 feeding, shelter, and migratory activities. Of this large grouping, over half are  
14 dependent upon wetland habitats at some point in their life cycles, and would  
15 decline or disappear in the absence of wetlands. Wetlands also contain unique  
16 vegetative communities that harbor many species of rare and unusual plants.

**17 Fish and Wildlife Populations and Habitat**

18 Optimum habitat for Pacific Northwest salmon and other fish is one that resembles  
19 the riparian landscape of pre-settlement times: braided streams wandering freely  
20 through nearly continuous forest; trees overhanging and partly fallen into streams;  
21 stream beds with abundant logs, step waterfalls, pools, and cutbanks; and  
22 vegetated marine and estuarine communities. In most cases, it is not realistic to  
23 return to that state. However, measures can be taken to retain or regain those  
24 features that provide the minimum requirements of a viable fishery.

25 The best habitat for native wildlife includes native plants, which are more closely  
26 matched to local soils, climate, and wildlife. They provide the right kinds of food,  
27 shelter, and diversity needed by wildlife. Native plants frequently need less  
28 watering, spraying, pruning, fertilizing, or other maintenance than do exotic or  
29 imported plants. Loss of native vegetation through conversion to ornamental  
30 vegetation and non-native species can result in loss of wildlife habitat, increased  
31 competition to native wildlife from introduced species, such as starlings, and  
32 increased maintenance needs. Loss of native vegetation also can occur through  
33 invasions of non-native species, such as the spread of *Spartina*, which can  
34 drastically displace important native eelgrass and mudflat communities.

**35 Salmon Recovery Program**

36 The decline of salmonids throughout Washington and the Pacific Northwest over the  
37 past century is well established. Since 1991, numerous evolutionarily significant  
38 units (ESUs) of Pacific salmonids have been listed as endangered or threatened  
39 under the Endangered Species Act (ESA), including those of chinook, coho, chum,  
40 sockeye, and steelhead. Decline in wild salmonid abundances have been attributed  
41 to widespread loss and degradation of habitat, due to hydropower, residential and  
42 urban development, agriculture, forestry, and fishing and hatchery production.

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1 In the Nooksack basin, abundances of several salmonid stocks have diminished  
2 substantially from historical levels. The declines in local salmonid stocks, especially  
3 Chinook salmon, have had profound economic, cultural, and social impacts on the  
4 greater WRIA 1 community. Direct impacts include reduced jobs and income for  
5 commercial fisherman, severe curtailment of tribal and subsistence catch, and loss  
6 of tourism associated with recreational fishing. In addition, ESA listings impose  
7 constraints on the activities of local and tribal governments, businesses, the  
8 agricultural community, and citizens, who must seek to avoid or minimize take of  
9 listed species. Nonetheless, salmon remain an integral part of the natural and social  
10 landscape of Whatcom County and the Nooksack River Watershed. Recent  
11 watershed recovery planning and restoration efforts by federal, state, local, and  
12 tribal governments, non-profit organizations, businesses, and private citizens  
13 demonstrate a commitment to salmon recovery in WRIA 1.

14 The WRIA 1 Salmon Recovery Program is a multi-government planning effort with a  
15 WRIA-wide scope to address salmon recovery and protection of ESA and non-ESA  
16 listed salmonids.

17 WRIA 1 Salmon Recovery Strategy

18 The ultimate goal for salmon recovery in WRIA 1 is to recover self-sustaining  
19 salmonid runs to harvestable levels through the restoration of healthy rivers and  
20 natural stream, river, estuarine, and nearshore marine processes; careful use of  
21 hatcheries; and responsible harvest, with the active participation and support of  
22 local landowners, businesses, and the larger community. The purpose of the *WRIA*  
23 *1 Salmonid Recovery Plan* is to identify the actions necessary to recover WRIA 1  
24 salmonid populations, especially listed species, and to outline the framework for  
25 implementation of recommended actions that have been agreed to by local, state,  
26 tribal, and federal governments and stakeholders in WRIA 1. In the near term, the  
27 objectives are to:

- 28 1. Focus and prioritize salmon recovery efforts to maximize benefit to the  
29 two Nooksack early chinook populations;
- 30 2. Address late-timed Chinook through adaptive management, focusing in  
31 the near-term on identifying hatchery versus naturally-produced  
32 population components;
- 33 3. Facilitate recovery of WRIA 1 bull trout and steelhead by implementing  
34 actions with mutual benefit to early chinook, bull trout, and steelhead, by  
35 removing fish passage barriers in presumed bull trout and steelhead  
36 spawning and rearing habitats in the upper Nooksack River watershed;  
37 and
- 38 4. Address other salmonid populations by (a) protecting and restoring WRIA  
39 1 salmonid habitats and habitat-forming processes through regulatory and  
40 incentive based programs; and (b) encouraging and supporting voluntary  
41 actions that benefit other WRIA 1 salmonid populations without diverting  
42 attention from early chinook recovery.

43 Focusing efforts on early chinook is consistent with regional salmon recovery,  
44 current abundance and productivity for the two populations is very low and

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1 recovery of both populations is critical to delisting and recovery of the Puget Sound  
2 Evolutionarily Significant Unit (ESU) for Chinook salmon.

### 3 Salmon Recovery Board (SRB)

4 WRIA 1 Salmon Recovery Board membership includes the County Executive,  
5 Bellingham Mayor, Mayors of the Small Cities of Whatcom County, the regional  
6 director of the Washington Department of Fish and Wildlife, and policy  
7 representatives from Lummi Nation and Nooksack Indian Tribe.

8 The WRIA 1 Salmonid Recovery Plan (2005), a chapter of the Puget Sound Salmon  
9 Recovery Plan, guides restoration in the Nooksack River and adjacent watersheds.  
10 This plan was developed in partnership with Nooksack Tribe, Lummi Nation,  
11 Washington Department of Fish and Wildlife, Bellingham, Whatcom County  
12 Government, and the small cities of Whatcom County. Chinook salmon populations  
13 (listed as threatened with extinction under the Federal Endangered Species Act) are  
14 prioritized, yet the plan also provides the template for recovery of threatened  
15 steelhead and bull trout and the other salmon and trout populations native to  
16 Whatcom County.

17 The salmon plan was developed in parallel with the WRIA 1 Watershed Management  
18 Plan. Salmon habitat is intricately linked to watershed management; salmon  
19 recovery will be most successful when fish habitat objectives are carefully  
20 coordinated with watershed management objectives. Integrating salmon recovery  
21 with flood hazard management and restoring fish passage under County roads are  
22 two primary areas of focus.

### 23 **Marine Resources Management**

24 Marine habitats include all saltwater bodies and their shorelines, kelp and macro  
25 algae beds, eelgrass meadows, salt marshes, beaches, and mudflats. These  
26 habitats play a vital role in the health of the local environment, as well as of the  
27 broader Puget Sound region. They provide spawning, rearing, and feeding grounds  
28 for a wide variety of marine life, as well as refuge for juvenile and adult fish, birds,  
29 and shellfish. The vegetation on back-shore marshes and within estuaries buffers  
30 adjacent upland areas by absorbing wave energy and slowing erosion.

31 Symptoms of ecosystem stress include: declining stocks of salmon, bottomfish, and  
32 forage fish; closures of recreational and commercial shellfish beds; degradation and  
33 losses of eelgrass beds, kelp forests, and other marine habitats; and dwindling  
34 populations of seabirds and marine mammals.

35 The Northwest Straits Marine Conservation Initiative was authorized by Congress in  
36 1998. The Initiative established the Northwest Straits Commission and Marine  
37 Resources Committees (MRCs) in seven western Washington counties, including  
38 Whatcom County. The MRCs' main purpose is to guide local communities, using up-  
39 to-date information and scientific expertise, to achieve the important goals of  
40 resource conservation and habitat protection within the Northwest Straits. The  
41 Whatcom County MRC acts as an advisory committee to the Whatcom County  
42 Council.



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Shellfish Recovery

Many of the marine waterbodies in Whatcom County support natural and cultured bivalve shellfish, including oysters and many species of clams. The warm, nutrient-rich tide flats in and around Lummi, Portage, and Birch Bays; Drayton Harbor; and Eliza and Lummi Islands represent unique water resources in this regard. Commercial shellfish growers, recreational clam and oyster harvesters, and Native Americans have used this resource for many years. It is an important part of our community's heritage.

Our ability to grow and harvest shellfish that is safe for human consumption is directly linked to surface water quality and the influence it has on marine waters. The primary measure of water quality for shellfish harvesting is bacterial contamination. There are many potential sources of fecal bacteria, such as municipal sewage treatment plants, on-site sewage systems, boat waste, farm animals, pets, and wildlife. Since 1995, valuable shellfish beds in Portage Bay and Drayton Harbor have been downgraded (harvest prohibited) due to non-point pollution impacting recreational, tribal, and commercial harvesting. In 2014, Portage Bay was identified as a threatened Shellfish Growing Area by the Washington Department of Health. (Washington Department of Health, 2014)

*Shellfish Protection Advisory Boards*

Whatcom County has three Shellfish Protection District Advisory Committees, one for each of the Shellfish Protection Districts: Birch Bay, Drayton Harbor, and Portage Bay. Each advises the County Council on proposed actions and operations relating to the restoration of water quality in their respective watersheds.

*Shellfish Recovery Plans*

Shellfish Recovery Plans have been created for each of three districts. The plans outline the primary sources of bacteria and actions to improve water quality:

- Drayton Harbor Shellfish Recovery Plan (2007)
- Portage Bay Shellfish Recovery Plan (2014), Portage Bay Initial Closure Response Strategy (1998)
- Birch Bay Initial Closure Response Strategy (2009)

*Pertinent Documents*

- Whatcom Marine Resources Committee 2011 - 2015 Strategic Plan (2010)

This document outlines the MRC's mission, vision, values, goals, objectives, and strategies for achieving them.

~~Shoreline Management Program~~

~~The State Legislature passed the Washington State Shoreline Management Act (SMA) in June 1971. The SMA was overwhelmingly passed by public initiative in 1972. Under the SMA, each county and city was required to prepare a shoreline "master program" in accordance with the shoreline guidelines issued by the State Department of Ecology in 1972.~~

~~The Whatcom County Shoreline Management Program (SMP), WCC Title 23, is the document that implements the goals and policies of the SMA at the local level. It was adopted in 1976 in accordance with RCW 90.58. The goals and policies of the~~

Comment [CES4]: Moved to Ch. 11.

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~~Whatcom County Shoreline Management Program also constitute the shoreline component of the Whatcom County Comprehensive Plan.~~

~~Under the provisions of the SMA, all development along shorelines of the state is required to comply with the provisions of local shoreline master programs. The Whatcom County Shoreline Management Program works with other chapters of the Whatcom County Code to protect and preserve saltwater and freshwater shorelines throughout the county by managing natural resources and directing development and land use suitable for the shoreline environment.~~

~~The Whatcom County Shoreline Management Program jurisdiction includes:~~

- ~~• More than 130 miles of marine shoreline;~~
- ~~• More than 60 miles of lake shoreline;~~
- ~~• More than 220 miles of stream channels; and,~~
- ~~• All wetlands and floodways associated with the above shorelines, together with all upland areas within 200 feet of the Ordinary High Water Mark (OHWM).~~

~~Whatcom County and the Washington State Department of Ecology (DOE) share joint authority and responsibility for the Whatcom County SMP. Whatcom County Planning and Development Services is the primary agency responsible for implementation of the Whatcom County Shoreline Management Program.~~

**Issues, Goals, and Policies**

**General – Ecosystems**

Development and urbanization of the land base have and may continue to result in the degradation and reduction of ecosystem functions. Wetlands and estuaries continue to be lost incrementally. Streams and their adjacent riparian habitat are affected by land clearing, ditching, erosion, and road building. Lakeshore development degrades the foreshore environment for waterfowl and other species, as well as negatively affecting water quality. It is estimated that Washington has also lost approximately one-third of its historic eelgrass beds from a variety of causes, including dredging, shading, and filling. Large-diameter snags and downed logs, an essential feature for dozens of wildlife species, are lost during clearing or intensive forest management. Forested habitats are lost to a number of development processes including urbanization, agriculture, increased rural/suburban housing density, and timber harvesting. The delicate environment of cliffs and caves may be affected by housing development, mining, and other activities. Conversely, grasslands, thickets, fields, and fence rows are habitats largely provided and enhanced by human activities, and are thus fairly abundant and stable within the developing county. The existence of farms, in particular, has contributed to an abundance of these more open, pastoral habitats.

Many stream systems in Whatcom County have been altered by agriculture, forestry, development, and flood control practices, contributing to low stream flows, fisheries loss, water pollution, sedimentation and other problems. These impacts can directly affect the fisheries resources by depositing silt and debris into spawning beds, by removing trees that shade and cool the water, bank armoring,

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1 interfering with the recruitment and establishment of large woody debris (LWD), by  
2 obstructing fish passage with culverts and roads, by altering natural channels  
3 through filling, bank hardening, and channelizing. In addition, the physical  
4 processes that create functional habitats for fish life stages are altered by  
5 increasing flows through stormwater runoff or consuming water volume for other  
6 out-of-stream uses.

7 Finally, a healthy and functioning ecosystem, including forests, wetlands, fish,  
8 wildlife, and native plants they harbor, is an identified resource. A healthy  
9 ecosystem supports diverse and abundant wildlife, fish, and plant populations, and  
10 is necessary. The gathering of fish, game, and other natural resources forms a  
11 central aspect of many cultures in Whatcom County. The mere presence of these  
12 natural resources constitutes a community amenity that is a substantial part of our  
13 local economic base.

14 **Goal 10K: Protect and enhance ecosystems, which provide**  
15 **economic, ecological, aesthetic, and cultural benefit.**

16 Policy 10K-1: Define and identify species, habitats, and habitat features  
17 important to a balanced and sustainable web of life, biodiversity,  
18 and especially important to fish, native plants, and wildlife.  
19 Create, and regularly update an Ecosystem Report.

20 Policy 10K-2: Develop and adopt programs that protect habitats essential to  
21 the conservation of species that have been identified as  
22 endangered, threatened, or sensitive by the state or federal  
23 government as well as habitats identified as necessary in the  
24 Ecosystem Report. These programs should maintain and  
25 encourage restoration of habitat conditions for listed species of  
26 concern, as well as habitats identified as having significant  
27 biodiversity, connectivity, and other important features and  
28 functions.

29 Policy 10K-3: Develop incentives for protection of environmentally fragile  
30 areas or critical plant and wildlife habitats as well as habitats  
31 that provide connectivity (corridors).

32 Policy 10K-4: Where feasible, incorporate fish and wildlife habitats into public  
33 capital improvement projects.

34 Policy 10K-5: Provide measures to mitigate negative water quality and  
35 quantity impacts from both public and private alterations of  
36 natural drainage systems.

37 Policy 10K-6: Consider sensitive fish, shellfish, and wildlife species and their  
38 habitats when establishing zoning densities and patterns.

39 Policy 10K-7: Promote voluntary fish and wildlife habitat enhancement  
40 projects through educational and incentive programs, such as  
41 purchase of development rights or habitat conservation  
42 easements. These projects, which can be done by individuals,  
43 organizations, and businesses, will buffer and expand fish,  
44 plant, and wildlife habitat.

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- 1 Policy 10K-8: Give careful consideration to the siting of industrial, commercial,  
2 residential, and other land use designations when located near  
3 important marine, terrestrial, or other critical habitats.
- 4 Policy 10K-9: Protect, retain, and enhance the beneficial uses and functions of  
5 streams and rivers. Define and identify the beneficial uses and  
6 functions of streams and rivers, including wildlife and fisheries  
7 habitat, water quality, open space, aesthetics, and recreation.
- 8 Policy 10K-10: Protect and enhance ecosystem functions when flood hazard  
9 management measures are used.
- 10 Policy 10K-11: Regulate the operation of river gravel extraction activities in  
11 such a manner so as to provide long-term protection of fish and  
12 wildlife habitat and water quality.
- 13 Policy 10K-12: Ensure design and development of residential and industrial  
14 development minimizes disturbance to rivers, streams, and  
15 functioning riparian areas.
- 16 Policy 10K-13: Evaluate the full value of the fishery; including its cultural and  
17 economic value; in land use decisions that may impact that  
18 fishery. Unavoidable impacts to an individual habitat or fishery  
19 shall be mitigated.
- 20 Policy 10K-14: Continue to consider the value of wildlife populations for which  
21 habitat conservation areas have been identified in PDS’s wildlife  
22 habitat mapping, their associated habitats, and connectivity in  
23 land use planning that may impact them. This is not intended to  
24 require landowners to pay for any additional studies.
- 25 Policy 10K-15: Mitigation to Habitat Conservation Areas should be tracked and  
26 monitored to ensure no net loss to natural area.
- 27 Policy 10K-16: Monitor Habitat Conservation Areas to obtain a baseline of  
28 current conditions and to ensure no net loss and avoidance of  
29 cumulative impacts.

**Fish and Wildlife Populations and Habitat**

- 31 **Goal 10L: Protect and enhance ecosystems that support native fish**  
32 **and wildlife populations and habitat.**
- 33 Policy 10L-1: Strongly discourage any activity that might cause significant  
34 degradation of the fishery resource or habitat.
- 35 Policy 10L-2: Support the protection and enhancement of significant fish  
36 spawning and rearing habitat, food resources, refugia (shelter),  
37 and travel passages.
- 38 Policy 10L-3: Establish non-regulatory mechanisms and incentives for  
39 development that accommodates the habitat needs of fish and  
40 wildlife and encourages good stewardship practices.

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- 1 Policy 10L-4: Support protection and enhancement of fish and wildlife habitat  
2 through site design in new development.
- 3 Policy 10L-5: Native vegetation and soils on streambanks and shorelines  
4 should be disturbed as little as possible. In situations where re-  
5 vegetation is necessary to restore streambank or shoreline  
6 stability and provide shading, site-specific native plants should  
7 be used. Retention of vegetated riparian areas on all lake and  
8 marine shorelines shall also be encouraged.
- 9 Policy 10L-6: Discourage shoreline armoring. Instead, encourage natural or  
10 bio-engineering solutions such as planting native vegetation,  
11 engineered log jams/LWD, and beach nourishment along  
12 eroding banks to address stream and shoreline bank erosion  
13 problems. Riparian buffers should be replanted with suitable  
14 native vegetation as a part of all bank stabilization projects.
- 15 Policy 10L-7: Encourage native vegetation and soil retention and plantings  
16 that provide or maintain the beneficial uses and functions of  
17 streams, rivers, lakes, and marine shorelines.
- 18 Policy 10L-8: Maintain and encourage restoration of habitat functions for  
19 threatened and endangered fish species.
- 20 Policy 10L-9: Use Best Available Science to inform the creation of regulations  
21 to mitigate adverse impacts of development adjacent to rivers,  
22 streams, and marine shorelines.
- 23 Policy 10L-10: Encourage landowners to voluntarily protect surface water  
24 quality with filter strips or other appropriate water cleansing  
25 mechanisms installed between lawns, landscaping, livestock  
26 pens, or agricultural fields and waterbodies.
- 27 Policy 10L-11: Formulate and implement a comprehensive, landscape-based,  
28 environmental management program to protect fish and wildlife.  
29 The program should include the following:
- 30 1. Formulate an administrative approach to the review of  
31 development and planning proposals that consider natural  
32 system policies;
- 33 2. Investigate and develop programs for acquisition and  
34 restoration of important fish and wildlife habitat areas;
- 35 3. Develop and enter into cooperative agreements with State  
36 and Federal agencies and neighboring jurisdictions to identify  
37 and protect ecosystems;
- 38 4. Identify and map important habitat corridors and  
39 connectivity throughout the county; and,
- 40 5. Support the development of educational materials which list,  
41 describe, and characterize the appropriate use of native  
42 vegetation to enhance ecosystem functions in Whatcom  
43 County.

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- 1 Policy 10L-12: Consider establishing formal meander limits for the Nooksack  
2 River, precluding additional development within this zone, and  
3 promote the River and Flood property acquisition program  
4 within these areas.
- 5 Policy 10L-13: Diligently work to prevent and/or reduce the establishment  
6 and/or spread of invasive species.
- 7 Policy 10L-14: Actively participate in and support WRIA 1 Salmon Recovery  
8 efforts to return self-sustaining salmonid runs to harvestable  
9 levels through: the restoration of healthy rivers, marine  
10 shorelines, and natural processes; the careful use of hatcheries;  
11 and responsible harvest.
- 12 Policy 10L-15: Participate in protection and improvement of biodiversity.
- 13 Policy 10L-16: Consider establishing important habitat areas as sending  
14 areas after creating a voluntary, workable transfer of  
15 development rights (TDR) program.
- 16 Policy 10L-17: Mitigation of wetlands should be reviewed and tracked over time  
17 to ensure no net loss of wetland function.
- 18 Policy 10L-18: A baseline of wetland identification and function should be made  
19 to track and prevent net loss and avoid cumulative impacts.
- 20 Policy 10L-19: The County will support the work of the Fisheries Co-managers  
21 (Lummi Nation, Nooksack Tribe, and the State Department of  
22 Fish and Wildlife) and stakeholders to establish a sustainable  
23 salmon harvest goal for the Nooksack Basin.

**Comment [P/C5]:** This proposed amendment is not part of the SMP Update. Rather, it is a policy the Council expressed in interest in adding in support of the fisheries co-manager's Sustainable Salmon Harvest Goal. Adding such a policy was placed on the docket by Council in 2018 (#PLN2018-00010).

**24 Wetlands**

25 Wetlands are crucial environmental features in Whatcom County. Wetlands provide  
26 invaluable functions in aquifer recharge, groundwater storage, floodwater  
27 detention, pollutant removal and purification of water supplies, as well as provision  
28 of fish and wildlife habitat. Loss of wetlands has been due to many factors,  
29 including urbanization, agricultural development, and drainage projects.

30 A plethora of complex and often confusing laws govern the definition, delineation,  
31 and protection of wetlands. These laws originate at national, state, and county  
32 levels. Land managers and private citizens often experience difficulty in  
33 interpreting, synthesizing, and applying wetland regulations. In general, however,  
34 state regulations must comply with federal standards and local regulations must  
35 comply with both federal and state standards.

**36 Goal 10M: Conserve and enhance regulated wetlands.**

- 37 Policy 10M-1: Recognize natural wetlands such as swamps, bogs, saltwater  
38 marshes, and ponds for their value in cleaning water, reducing  
39 flood damage, providing valuable habitat for plants, fish and  
40 wildlife, and as sites for groundwater recharge.

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- 1 Policy 10M-2: Develop and adopt criteria to identify and evaluate wetland  
2 functions that meet the Best Available Science standard and  
3 that are consistent with state and federal guidelines.
- 4 Policy 10M-3: Biological functions of wetlands are complex and interwoven.  
5 Evaluate the full range of potential and immediate economic  
6 impacts in land use decisions relating to wetlands, including  
7 fisheries, wildlife, recreation, farmlands, sustainable resources,  
8 air and water quality, flood hazard management, real estate,  
9 cultural attributes, and other uses.
- 10 Policy 10M-4: Encourage land development to avoid wetland impacts. Impacts  
11 to regulated wetlands should be contingent upon full mitigation  
12 measures that equitably compensate for wetlands impacts, on a  
13 case-by-case basis. Approved mitigation measures shall include  
14 resources for long-term monitoring and adaptive management  
15 of mitigation outcomes to assure effectiveness. Strongly  
16 discourage alteration of land that results in the degradation of  
17 type 1 and 2 wetlands.
- 18 Policy 10M-5: Property rights and public services are essential components of  
19 our political and economic system. Where such rights and public  
20 services are significantly compromised by the goal of wetland  
21 preservation, adverse wetland impacts may be permitted  
22 through standardized mitigation. This may include avoidance,  
23 impact minimization, restoration, enhancement, creation, or off-  
24 site compensation for loss of wetland functions in accordance  
25 with mitigation sequencing.
- 26 Policy 10M-6: Recognize beneficial wetland uses, functions, and values.  
27 Support protection of fish and wildlife habitat, water quality,  
28 plant diversity, flood attenuation and low-flow contribution, and  
29 water storage through planning, acquisition, incentive programs,  
30 and mitigation.
- 31 Policy 10M-7: Development applications should be assessed on a case-by-case  
32 basis so that marginal wetlands are not preserved at the  
33 expense of upland areas with higher habitat value.
- 34 **Marine Habitat**
- 35 **Goal 10N: Protect and enhance marine ecosystems and resources in**  
36 **Whatcom County.**
- 37 Policy 10N-1: Support the Whatcom County Marine Resources Committee in  
38 its pursuit of the Northwest Straits Commission benchmarks as  
39 follows:
- 40 ▪ Broad county participation in MRCs;
  - 41 ▪ A net gain in high-value habitat and ecosystem functions;
  - 42 ▪ A net reduction in shellfish bed closures;





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- 1 Policy 10P-10: Continue to partner with jurisdictions in British Columbia to  
2 minimize impacts on water quality, including what affects  
3 shellfish habitat.
- 4 Policy 10P-11: Work within the structure of County programs such as the WRIA  
5 Watershed Management Planning process to achieve  
6 improvements in land use Best Management Practices that will  
7 positively affect change in marine water quality.
- 8 Policy 10P-12: Continue to develop programs that identify potential pollution  
9 sources and ensure timely and science-based approaches are  
10 used in response to problems as they arise.
- 11 Policy 10P-13: Develop educational tools and opportunities to raise public  
12 awareness of marine issues and to inform them of how they can  
13 have a positive impact by helping preserve these marine  
14 resources.
- 15 Policy 10P-14: Identify areas (such as wetlands and the nearshore  
16 environment) that are important to shellfish habitat  
17 preservation. Also identify river and stream processes that  
18 adversely impact shellfish habitat. Use this information when  
19 making land use management and preservation decisions.
- 20 Policy 10P-15: Create a tracking mechanism to document progress made  
21 toward improving downgraded shellfish areas. This information  
22 will be useful not only in supporting an upgrade when water  
23 quality shows improvement, but also in preventing degradation  
24 in currently approved shellfish areas.
- 25 Policy 10P-16: Work with the County Shellfish Advisory Committees, Marine  
26 Resources Committee, Salmon Recovery Fund Board, WRIA  
27 Watershed Management Board, and other local, state, federal,  
28 and tribal agencies to address issues associated with shellfish,  
29 shellfish area closures, and shellfish habitat.
- 30 Policy 10P-17: Consider establishing the Drayton Harbor Watershed as a  
31 sending area when considering a transfer of development rights  
32 (TDR) program in.
- 33 Policy 10P-18 Support the Department of Health's On-Site Sewage System  
34 (OSS) Program as a means to lower degradation of our  
35 waterways.

**36 Other Marine and Marine Dependent Organisms and Systems**

37 Our Marine system supports not only local, critical, and global fisheries resources,  
38 but also a myriad of interdependent organisms, the importance of which we lack  
39 the capacity to fully grasp. The Marine ecosystem is a complex web of life that is  
40 increasingly affected by anthropogenic impacts. Toxics, hormones, heavy metals,  
41 and other harmful substances flushed into nearshore and marine environments with  
42 stormwater have been shown to have deleterious cumulative impacts on a range of  
43 aquatic and marine dependent organisms. Whatcom County will take steps to halt

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- 1 the practice of treating its streams and rivers as a storm sewer and the marine  
2 system as a water treatment facility.
- 3 Policy 10P-19: Promote Best Management Practices, land use, and stormwater  
4 policies that result in a minimal release of harmful chemicals  
5 and metallic substances into surface water and the marine  
6 environment.