

Natural Environment Element

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INTRODUCTION

Bonney Lake residents cherish their community’s natural setting. Bonney Lake’s lakes, forests, and Fennel Creek corridor give it character. Land developers and regulators must take the area’s topography, geology, water resources, vegetation, and wildlife into account if the natural beauty is to be preserved and environmental hazards are to be avoided. The maps at the end of this element identify sensitive areas around Bonney Lake. In some critical areas, development should be avoided altogether. In other cases, impacts can be mitigated with good site design and engineering.

The Growth Management Act establishes the following goals related to the natural environment:

Environment. Protect the environment and enhance the state’s high quality of life, including air and water quality, and the availability of water.

Open Space and Recreation. Encourage the retention of open space and development of recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks.

Natural Resource Industries. Maintain and enhance natural resource-based industries, including productive timber, agricultural and fisheries industries. Encourage the retention of productive forest lands and productive agricultural lands, and discourage incompatible uses.

The Growth Management Act (GMA) and associated state regulations require cities and counties to:

- establish policies for protecting ground waters used for public water supplies and for managing storm water runoff to prevent flooding and pollution;
- decide what natural resource lands (timber, agriculture, and mineral) to designate;
- protect anadromous fish (fish that migrate up from the ocean to spawn); and
- use “best available science” to protect critical areas including wetlands; aquifer recharge areas; fish and wildlife habitat, frequently flooded areas; and geologically hazardous areas. The latter includes steep slopes, seismic areas, and volcanic hazard areas.

This following goal relates to the natural environment in general. It is further implemented by policies relating to geologic hazards.

Goal 2-1 *Protect the natural environment and avoid losses resulting from development in environmentally hazardous areas.*

Policy 2-1a *Protect significant natural features, including the Fennel Creek corridor, fish and wildlife habitat areas, lakes, and wetlands.*

Policy 2-1b *Maintain information on critical areas.*

Policy 2-1c *Discourage development of environmentally constrained land unless the development is engineered to withstand the constraint.*

Policy 2-1d *Use “best available science” as defined by the GMA in regulating critical areas.*

GEOLOGIC HAZARDS

Steep Slopes

Glaciers, volcanoes, and rivers shaped this area. The foundation consists of impermeable sedimentary and volcanic bedrock of Eocene to Miocene age. Receding glaciers left 5-100 feet of till, ranging from porous sand and gravel to hardpan composites. Glaciers, glacial melt water, and rivers created the Puyallup valley. The west edge of the Bonney Lake plateau drops off to the Puyallup valley in slopes ranging from 40 to 50%. Lesser slopes are found along the flanks of the Fennel Creek valley. The plateau itself undulates up to 75 feet in elevation.

Unstable slopes pose a major hazard to development. The soils common to the Bonney Lake area are susceptible to landslide at slopes of 15% or more. The slopes bordering the Puyallup valley are highly dangerous because of their steepness and their soils, which consist of unconsolidated glacial materials. Slopes generally collapse when their soils become oversaturated during rain storms. Such failure is especially likely where a permeable layer lies atop a less permeable layer because percolating water seeps out at the layer boundary. Steep slopes overlooking Fennel Creek can landslide when the creek erodes into the bank, removing the slope's footing. See the Steep Slopes Map at the end of this element.

Policy 2-1e Discourage development and disturbance of native vegetation on steep slopes.

Policy 2-1f Require buildings to be set back from the toe and top of unstable slopes.

Policy 2-1g Require geotechnical or engineering proof that any proposed development in areas of steep slope hazard has been designed to withstand the hazard and not aggravate the hazard for other properties.

Soil Impermeability and Erosion

The plateau's soils were initially formed during the Vashon glaciation. Most are in the **Alderwood - Everett soil association**. Alderwood soils are moderately well drained on the surface and slow draining underneath, restricting the use of septic tank systems. Seasonal ponding is common in low areas. Everett soils are rather gravelly and permeable. Both soils are poor for farming but good for pasture, timber, and for urban uses if connected to public sewers (percolation may be excessive for on-site septic systems).

Soils in the Fennel Creek valley are in the **Buckley association**. Their parent material is a lobe of the Osceola mudflow, a portion of Mount Rainier which liquefied and came to rest on the Buckley-Enumclaw plateau about 4,800 years ago. Toward the extremity of its spread it followed the Fennel Creek valley, which had been carved in the Ice Age by glacial meltwater. The mudflow subsequently oxidized and cemented. The topsoil is generally a thin, dark, organically rich, alluvial loam. The subsoil is a mottled, nearly impermeable composite of gravel, sand, loam, and clay. Below that lie pre-Osceola glacial and alluvial sediments. The Buckley soil's low permeability and flat terrain cause the surface to remain wet so much of the year that it is considered a hydric soil. Plants tend to grow on it that can tolerate having their roots saturated during a portion of the growing season. Buckley soils are excellent for pasturage.

Along the edges of the Fennel Creek valley are some **Indianola soils**. These are somewhat excessively drained soils formed in sandy glacial outwash on broad uplands. Surface runoff is slow, and the erosion hazard is slight. They can support high density housing and septic systems.

Kapowsin soils are found around the edges of the Fennel Creek and Puyallup valleys. They are moderately well drained at the surface with a relatively impermeable substratum about two feet down. Ponding is common. Kapowsin soils are suited for some agricultural uses and for urban activities if connected to public sewers (percolation may be insufficient for on-site septic systems).

Muck deposits can be found around the lakes and wetlands. These have low compressive strength and will not support buildings or roads without significant engineering. **Xerocherpts** indicates steep slopes.

Thus, much of Bonney Lake is flat and poorly drained. Winter wet spots generally represent a water table which has risen to or above the surface. During heavy rains these soils can experience shallow flooding. Floodwaters can carry surface and subsurface pollutants directly into surface waters and water tables. These soils are especially vulnerable to contamination from malfunctioning septic systems.

Land clearing, earth movement, and unmanaged stormwater can cause erosion which damages the site itself, the downstream drainage network, and aquatic habitat. The finer the soil and the steeper the slope, the greater the erosion hazard. In Bonney Lake, disturbance of slopes greater than 15% may require anti-erosion measures.

The Soil Associations Map at the end of this element shows the distribution of the soil associations highlighted above. Some have impermeability and erosion hazards, as stated above.

Policy 2-1h *Ensure that soils are suitable for the development proposed. Where soil suitability is questionable, require review by a qualified earth scientist.*

Policy 2-1i *Encourage retention or replacement of native ground cover in erosion hazard areas.*

Policy 2-1j *When erosion hazard areas are disturbed, require erosion control measures and limit the duration of site exposure.*

Seismic Hazards

The Puget Sound area is seismically active. An earthquake could cause improperly built structures to collapse, trigger landslides, and liquefy loose, saturated soils such as exist in the Fennel Creek wetlands. Liquefaction is also likely in the muck and peat deposits adjacent to Lake Tapps and Lake Bonney. Thus, seismic hazards do not result in distinct hazard areas so much as aggravate the hazard associated with steep slopes and unsuitable soils.

Mount Rainier is an active volcano. It has erupted over 60 times in the past 10,000 years, most recently about 160 years ago. The Bonney Lake plateau is far enough away to avoid lava flows, blown rock, and landslides. It is probably high enough to avoid the mudflows that are likely in the South Prairie Creek, Carbon River, Puyallup River, and White River valleys, though such mudflows could cut Bonney Lake's communications. Bonney Lake's likeliest severe impact is that it could be blanketed with volcanic pumice and dust if the mountain erupts through its northwest flank or if the wind is blowing northwest.

Policy 2-1k *Enforce building codes designed to prevent earthquake damage.*

Policy 2-1l *Cooperate with other agencies in preparing evacuation plans in the event of eruption.*

WATER RESOURCES

Groundwater

Groundwater movement is affected by the porosity of geologic strata. See the above discussion of soils. Soil porosity also affects septic systems. Malfunctioning septic systems can contaminate groundwater and surface water (lakes and streams) with pathogenic organisms. Bonney Lake Manor, Cedar View, and other areas are not served by public sewers. The septic systems in these areas generally appear to be functioning satisfactorily. The Pierce County

Health Department regulates septic systems within Bonney Lake. With proper design and maintenance, on-site septic systems can last indefinitely.

The City of Bonney Lake draws its water from four wells and two springs. The springs generally produce the least in the early fall. Water quality is good, with low iron and manganese content and below 100 parts per million of total hardness. Coliform counts in the raw spring water have been very low in past years. The City's four producing wells are located at Tacoma Point and in the Lakeridge area.

Bonney Lake assessed risks to its water sources in its Wellhead Protection and Monitoring Program. The Tacoma Point Wells and Ball Park Well are relatively safe from contamination. Grainger Springs is only moderately safe from contamination because its recharge area is undergoing urban development. State Route 410, gas stations, septic systems, and other potential contamination sources lie upgradient of Grainger Springs. Victor Falls Springs is the least safe. Its three shallow spring collection areas lie near septic systems. Two of the springs regularly had nitrate concentrations above the naturally occurring level. However, Victor Falls Springs' nitrate levels do not exceed the Washington State Board of Health's maximum contaminant level. See the Utilities Element for a map of Bonney Lake's Wellhead Protection Zones.

Goal 2-2 *Protect Bonney Lake's underground water supply.*

Policy 2-2a *Evaluate the potential impacts of land development on aquifers supplying public water.*

Policy 2-2b *Work with Pierce County, the Washington State Department of Ecology, and other agencies to protect Bonney Lake's water supply from contaminants originating outside the city limits.*

Policy 2-2c *Manage surface water so as to maintain water quality and maximize groundwater recharge.*

Policy 2-2d *Require new subdivisions and commercial development to connect to public sewers.*

Policy 2-2e *Encourage homes and businesses with septic systems to connect to public sewers.*

Surface Water

Lake Tapps

Puget Sound Energy (PSE) created Lake Tapps in 1910 by diverting water from the White River into a diked area of the plateau. The flume begins at Buckley, ten miles to the east. The 2,500-acre reservoir united four small lakes. The reservoir powers the Dieringer hydroelectric plant. Federal and state agencies regulate how much river water PSE can divert. The lake's usable storage capacity is 46,700 acre-feet. Maximum depth is 90 feet, average depth is about 25 feet. The lake's shoreline is about 40 miles long at high water, with many narrow inlets and islands. The surface elevation normally varies between 514 feet and 543 feet, depending on power requirements. When the lake level is lowest, in December and April, tree stumps and debris are exposed in the areas that were originally land. The White River comes from glacial streams. Even in summer, water enters the lake at 54 degrees Fahrenheit. In shallow areas, the sun may warm the water to 68 degrees. The lake's turbidity (cloudiness) is caused by glacial rock powder suspended in the water, though the water has been through two settling basins. Turbidity is greatest in the main channel toward the center of the lake and tapers off at the shores. Lake Tapps provides excellent recreational opportunities. Boating and water skiing are popular. Swimming is popular where the water is shallow enough to be warmed by the sun. Public boat launch ramps are provided at Pierce County's North Lake Tapps Park, and Bonney Lake's Allen Yorke Park. Private boat launches include Driftwood Point Park, Jenks Park, Church Lake Park, Inlet Island Park, Tapp's Island Park, and PSE's park adjacent to North Lake Tapps Park. Many shoreline homeowners have boat moorages, docks, and access ramps. The Tacoma-Pierce County Department of Health monitors water quality at public beaches in summer months. It found coliform counts at the high end of the allowable range around Church Lake Park in recent years, but has not advised against swimming.

Lake Bonney

Lake Bonney is located in a depression fed by springs. The 17-acre lake’s maximum depth is about 19 feet. A weir on the outlet channel controls the lake level. The outlet channel is dry during much of the year when the evaporation and seepage exceed inflow. Algae blooms form during the summer due to the presence of sunlight and nutrients. Lake Bonney is used for swimming, fishing, and non-power boating. Almost the entire shoreline has been developed for homes. Waterfowl frequent the lake. Water quality data is not available.

Lake Debra Jane

A former swamp was altered to create Lake Debra Jane. It is about 15 acres in size and ranges from seven to 15 feet in depth. The lake is used for fishing, swimming, and non-power boating. Waterfowl frequent the lake. Lake Debra Jane is fed by local springs that are augmented in late summer by nearby wells. The lake has little inflow/outflow for two to three months during the year. Algae grow in the weeds along the shoreline, especially in the summer. Water quality data is not available.

Fennel Creek

See Fennel Creek Corridor, page 2-10.

Other Streams

The Streams and Floodplains map at the end of this element shows small unnamed seasonal streams draining Lake Debra Jane and Lake Bonney. These streams join near Church Lake Road then flow into Fennel Creek. Narrow wetlands lie along them. The State of Washington identifies the stream draining Lake Debra Jane, all the way to Fennel Creek, as Type 3 (Type F in the new typing system, meaning fish-bearing). The State identifies the stream draining Lake Bonney as Type 5 (Type Ns in the new typing system, meaning non-fish-bearing, seasonal).

The Streams and Floodplains map also shows several small unnamed Type 4 (Np: non-fish-bearing, perennial), 5 (Ns: non-fish-bearing, seasonal), and 9 (unsurveyed) streams. None come under Shoreline Management Act.

Goal 2-3 *Protect surface waters from pollution and development impacts.*

Policy 2-3a *Protect water bodies from point and non-point sources of contamination and nitrification.*

Policy 2-3b *Protect against erosion of drainage channels.*

Policy 2-3c *Encourage land developments to maximize stormwater infiltration.*

Policy 2-3d *Encourage vegetative buffers along streams and drainage ways to enhance water quality, protect habitat, and prevent erosion.*

Policy 2-3e *Mitigate stormwater-related impacts through best management practices.*

Flood Areas

A narrow 100-year floodplain lies along Fennel Creek and some of its tributary creeks. The City has no floodways (areas that must be kept entirely clear of development to allow floodwaters to pass). To minimize flood damage, and maintain FEMA flood insurance eligibility, the City has administered floodplain regulations since 1982. See the Streams and Floodplains map at end of this element.

Goal 2-4 *Avoid damage caused by flooding.*

Policy 2-4a *In the 100-year floodplain, discourage development and prohibit structures unless their base elevation is above the floodplain elevation.*

Policy 2-4b *Protect floodplains and stream channels from filling, excavating, and other activities that would interfere with natural drainage patterns.*

Policy 2-4c *Preserve wetlands for their flood storage functions.*

Wetlands

Wetlands perform many important ecological functions that benefit society, including

- fish and wildlife habitat;
- filtration of sediments, excess nutrients, and chemicals from surface water;
- groundwater recharge;
- storage of floodwaters, thus decreasing flood damage;
- attractive open space; and
- educational and scientific research opportunities.

In the past these functions were not understood. Many wetlands were senselessly destroyed by clearing, dredging, draining, and filling. Now, scientists study wetlands in the path of development to determine which functions they perform, and how well. Such evaluations are known as “wetland functions and values.”

The following table identifies sources of information on Bonney Lake’s wetlands. None of them are definitive. These sources are primarily maps, derived from aerial photographs and soil surveys. None have been field verified for more than a small sample of the wetlands. With respect at least to that portion of the data inside the Bonney Lake city limits, none have been maintained or updated with information from on-site wetland studies. All were intended only to show probability of wetlands. Field verification is necessary.

Sources of Information on Bonney Lake’s Wetlands

Name	Source	Date	Includes data on wetland type	Covers Bonney Lake’s entire 2003 city limits & UGA
Wetlands (Buildable Lands Program)	Leroy Surveying for Pierce County	2002		X
County Wetland Inventory	Pierce County	1992	X	
Wetlands map in 1996 Comprehensive Plan	City of Bonney Lake	1991		
National Wetlands Inventory	U.S. Fish & Wildlife Service	1991	X	X

The Wetlands Map at end of this element is a new composite. It combines data from the 2002 Wetlands (Buildable Lands Program) and the Wetlands map in the 1995 Comprehensive Plan. It is the City’s best current estimate as to the probable location of wetlands around Bonney Lake. Field verification is still necessary to verify, delineate, and classify individual wetlands.

The Bonney Lake area contains bogs, forested wetlands, scrub/shrub wetlands, wet meadows, shallow marsh wetlands, and deep marsh. The greatest concentration of wetlands is in the Fennel Creek corridor. See Fennel Creek Corridor, page 2-10. Wetlands also exist along swales draining Lake Bonney and Lake Debra Jane, along the certain

lake shoreline, and in a few isolated spots. Many of the wetlands support waterfowl. Some provide quality wildlife habitat. Many appear to be hydrologically connected with each other or the various surface waters. Beyond this, the wetlands have not been well studied.

Federal, state, and local government regulations now protect significant wetlands and an undisturbed buffer around the wetland. The higher the wetland's "functions and values," the wider the buffer must be. Wetland regulations apply to such wetlands as may exist, regardless of whether the wetland maps show wetlands there. Only site-specific studies can verify the presence, boundaries, and classification of wetlands. The Growth Management Act requires that jurisdictions use the 1997 Washington State Wetlands Identification and Delineation Manual to delineate wetlands for regulatory purposes. The Washington State Wetlands Rating System is used to evaluate the wetlands. Generally speaking, local governments can no longer permit the loss of wetland functions and values. However, it is sometimes permissible to allow damage to one wetland in exchange for enhancement or creation of another. This is known as wetland mitigation.

Goal 2-5 *Protect wetlands and the natural functions they perform.*

Policy 2-5a Allow no significant wetlands to be altered until their functions have been evaluated.

Policy 2-5b Allow no net loss of wetland functions and values.

Policy 2-5c Especially protect Class I wetlands and wetland corridors.

Policy 2-5d On a case-by-case basis, consider proposals to alter wetlands of lesser importance in exchange for effective wetland mitigation.

Policy 2-5e Avoid denying all reasonable use on any parcel.

Policy 2-5f Protect wetlands from water quantity or quality impacts stemming from improper stormwater management.

Policy 2-5g Encourage environmental stewardship programs aimed at wetland preservation.

Policy 2-5h Pursue implementation of a wetland mitigation banking program.

FISH AND WILDLIFE HABITAT

Wildlife Habitat

Urbanization and agriculture have reduced Bonney Lake's wildlife habitat, but our lakes, stream corridors, wetlands, floodplains, and forests support many plants and animals. They need this habitat to survive. Urban development and habitat conservation are not entirely incompatible. With sensitive design, a reasonable balance can be maintained. The GMA requires that critical wildlife habitat be preserved.

The Bonney Lake area contains much second-growth coniferous and deciduous forest of the type typical to the Puget Sound lowlands. The dominant conifers are Douglas fir and western hemlock. In dry areas the typical undergrowth are creambush oceanspray, California hazel, creeping snowberry, and salal. In climax forest one sees Pacific rhododendron, Oregon grape, vine maple, red huckleberry, and trailing blackberry. Moist habitats support sword fern and herbs. The Fennel Creek valley is covered by grasses, agricultural crops, and riparian (streamside) vegetation. The valley's wetlands are covered with red alder, cottonwood, Oregon ash, willow, and associated understory species. There are no known endangered or threatened plant species in the area, but several are present in the Puget Sound lowlands generally.

Riparian and wetland habitat is generally more important than forest habitat. Riparian zones are passageways for wildlife moving through developed areas. Riparian vegetation helps fish spawning by providing shade, bank stability, insects, and organic nutrients.

See the Priority Fish and Wildlife Habitat Map at end of this element. According to Pierce County’s inventory, more than 30 non-game species, 12 game species, 11 waterfowl species, and 93 species of amphibians, reptiles, and birds reside around Lake Tapps. Chipmunks, rabbits, skunks, and raccoons commonly inhabit the wooded areas. Black-tailed deer and coyotes can be found in the nearby rural and wooded areas.

The wetlands and stream corridors probably support muskrat, mink, otter, beaver, raccoon, and weasel. Fennel Creek valley is an important wildlife corridor. Mallards, widgeons, teals, coots, mergansers, great blue heron, and Canada geese nest and feed in the area’s water bodies, wetlands, and adjacent agricultural fields.

Crows, jays, nuthatches, woodpeckers, sparrows, winter wrens, ruffled grouse, blue grouse, band-tailed pigeon, Merriam’s turkey, owls, hawks, osprey, and eagles can feed and nest in the upland forests. Many can tolerate adjacent urban developments so long as some habitat and migration corridors remain undisturbed. Bald eagles and osprey inhabit the general area, and have been known to nest in trees near Lake Tapps.

The bald eagle is threatened under the federal Endangered Species Act. No other endangered or threatened animals are known in the Bonney Lake area, though several exist in the Puget Sound lowlands generally. “Candidate” mammals which may inhabit the area include the western gray squirrel and the western pond turtle. The Washington Department of Fish and Wildlife also maintains information on “priority species” and “species of concern.” Local species of concern may include the great blue heron, pileated woodpecker, purple martin, Vaux’s swift, and western bluebird.

Fish Habitat

See Fennel Creek Corridor, page 2-10.

Goal 2-6 *Provide sufficient diversity and abundance of fish and wildlife habitat to preserve native populations.*

Policy 2-6a *Preserve habitats for species which the state or federal government have identified as endangered, threatened, or sensitive.*

Policy 2-6b *Especially protect wildlife corridors, drainage corridors, wetlands, and steep slopes.*

Policy 2-6c *Promote retention of native vegetation, especially in aquatic and riparian habitats.*

Policy 2-6d *Protect water quality in lakes and streams.*

Policy 2-6e *Ensure that groundwater withdrawals and hard surfacing of aquifer recharge areas do not reduce stream flows below that necessary to support fish.*

Policy 2-6f *Promote clustered developments, common areas, buffers, and conservation easements as means of conserving critical habitat.*

FENNEL CREEK CORRIDOR

Because the Fennel Creek corridor combines surface water, wetlands, wildlife habitat, and fish habitat, and because the corridor is geographically so central to Bonney Lake, this Plan devotes this special section to it.

Fennel Creek begins at a spring near the intersection of SR-410 and 234th Ave. E. It flows west then south through a flat, shallow valley to Victor Falls, then west through a deep canyon to the Puyallup River. The creek collects surface and spring runoff all along the corridor, including excess flows from the municipal water supply springs near Victor Falls. The Fennel Creek drainage basin covers about 11 square miles, of which three square miles are located within the City of Bonney Lake. The Washington Department of Ecology classifies Fennel Creek's water quality as "A" (from a choice of AA, A, B, or C). See the Department of Ecology for further information. The creek's flow is too little to come under Shoreline Management Act jurisdiction.

The Washington Department of Fish and Wildlife designates Fennel Creek a Type 2 stream below Victor Falls and Type 3 (Type F in the new typing system) above Victor Falls. Fennel Creek has important fish habitat. Below the falls the creek contains steelhead, coho, chum, chinook, and pink salmon. The Puyallup River fall chinook and sea-run cutthroat trout are considered endangered or threatened. The Puyallup River spring chinook run is reportedly extinct.

Victor Falls prevents anadromous fish (fish that migrate up from the ocean to spawn) from migrating above the falls. This upper segment is Type 3 (Type F), meaning that it probably contains non-anadromous fish. The upper creek gently meanders through a wide valley, providing fish habitat of low to moderate quality. Non-trout fish species are known to exist above the falls. Also, human activities above the falls affect the health of salmonid habitat below the falls. Clearcutting and land developments have diminished fish runs by increasing water turbidity, temperature, and sediment load (which damages spawning beds). Changed flow rates may also impact fish.

Bonney Lake's greatest concentration of wetlands is also in the Fennel Creek corridor. (See Wetlands.) The corridor's riparian (streamside) vegetation, its linear nature, and its close association with wetlands make it Bonney Lake's most valuable asset in terms of wildlife habitat and biological potential.

In 1999, the Foster Wheeler Environmental Corporation prepared for the City an *Environmental Analysis of the Fennel Creek Corridor*. It thoroughly studied the corridor's environmental quality, providing a baseline for future comparison. The study split the corridor into four study areas, three above the falls and one below. It rated each study area in terms of 1) wetlands and vegetation, 2) hydrology (sinuosity and ability to handle peak flows), 3) soils, 4) fish and wildlife, and 5) water and sediment quality.

Finally, the *Environmental Analysis of the Fennel Creek Corridor* recommends improvements designed to remedy its environmental problems. For example, where the creek has been straightened it recommends that it be restored to its original sinuosity by installing diversion berms and large woody debris. Where riparian vegetation has been destroyed it recommends plantings. Where it floods a road the study recommends culverts. Where wetlands have been damaged it recommends that they be enhanced by hydrological connections and plantings. Because its wetland functions and values can be greatly enhanced at reasonable cost, the corridor has great potential for wetland mitigation. That is, if a wetland outside the corridor is in the path of development and not worth saving, the developer could pay to enhance wetlands inside the corridor, thus preventing a net loss of wetland functions and values. A formal mechanism for "transferring wetland functions and values" is called a wetland mitigation bank.

Goal 2-7 ***Protect Fennel Creek's natural functions.***

Policy 2-7a *Be especially diligent in applying to the Fennel Creek corridor those policies relating to surface waters, wetlands, and fish and wildlife habitat as stated elsewhere in this element.*

Policy 2-7b Help implement the Fennel Creek corridor environmental improvements identified in the 1999 Environmental Analysis of the Fennel Creek Corridor.

Policy 2-7c Pursue the idea of offering the corridor as a wetland mitigation site (see explanation above).

AIR QUALITY

The Puget Sound Air Pollution Control Authority administers air quality regulations. It monitors particulates, carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, and lead. Air quality is generally good around Bonney Lake. However, temperature inversions, common during fall and winter nights, can trap pollution from automobile exhausts, wood stoves, and industrial activities. Burn bans have proven necessary to control particulates. Winds can blow high ozone levels from Tacoma to the Bonney Lake area.

NOISE AND GLARE

Noise from machinery, traffic, and human activities disturbs the peace. Outdoor lights sometimes create unwanted glare. If directed upward, outdoor lights illuminate the night sky, reducing visibility of the stars. The City can reduce these impacts by keeping them in mind as it reviews proposed land developments and by administering regulations designed to control noise and glare.

Goal 2-7 Promote clean air and minimize noise and glare impacts.

Policy 2-7a Encourage environment-friendly heating in new construction.

Policy 2-7b Use the City's general police powers to control noise.

Policy 2-7c Prohibit lighting that is excessive or directed where not wanted, including into the sky.

Policy 2-7d Regulate construction activities, site design, building design, and outdoor lighting to minimize noise and unwanted glare.

NATURAL RESOURCE LANDS

The GMA requires jurisdictions to prevent urban conversion of resource lands (timber, agricultural, and mineral) of long-term commercial significance. The City recognizes no such lands in the 2003 city limits nor in the 2003 approved UGA. However, the proposed Fennel Creek Corridor UGA contains areas which Pierce County has designated as "urban agricultural land of long-term commercial significance." The City proposes to retain that designation for those lands. The County has also designated various lands adjacent to City or its Urban Growth Area.

Goal 2-8 Preserve natural resource lands of long-term commercial significance.

Policy 2-8a Retain Pierce County's designation of "urban agricultural land of long-term commercial significance" for properties so designated in the proposed Fennel Creek Corridor UGA.

Policy 2-8b Allow continued timber, agricultural, and mineral production in areas which currently produce such products but which the City has not designated to be “of long-term commercial significance” if such production is compatible with their urban context.

Policy 2-8c Remain open to further designations of “long-term commercial significance” on land shown to merit that designation.




Policy 2-8d Ensure that land uses proposed adjacent to resource lands of long-term commercial significance are compatible with such resource extraction activities.

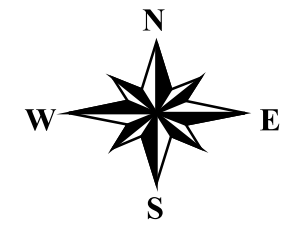
Policy 2-8e Wherever mineral extraction is proposed, require environmental performance guarantees, screening of surrounding areas such as by means of berms or landscaped buffers, and post-termination reclamation plans.



Bonney Lake Comprehensive Plan

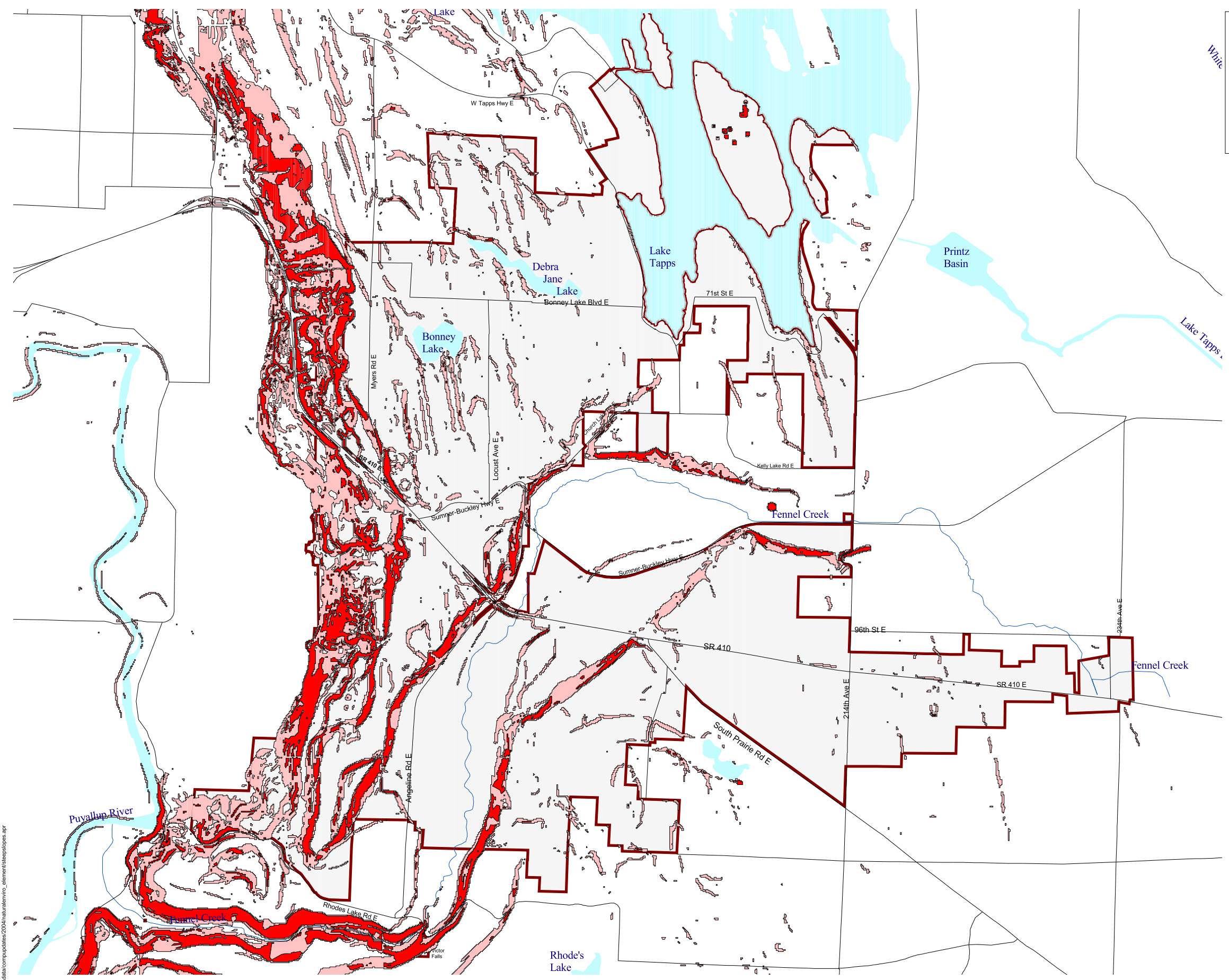
Steep Slopes

-  City boundaries
-  Slopes: 40-100%
-  Slopes: 20-40%



0  1 Miles

WARNING: This map of environmentally sensitive areas is intended as an indicator. Though compiled from the best data available to the Planning & Community Development Department at the time of publication, it is only approximate. In order to ensure that "best available science" is used to protect natural resources, the City may require further data-gathering before issuing a development permit.

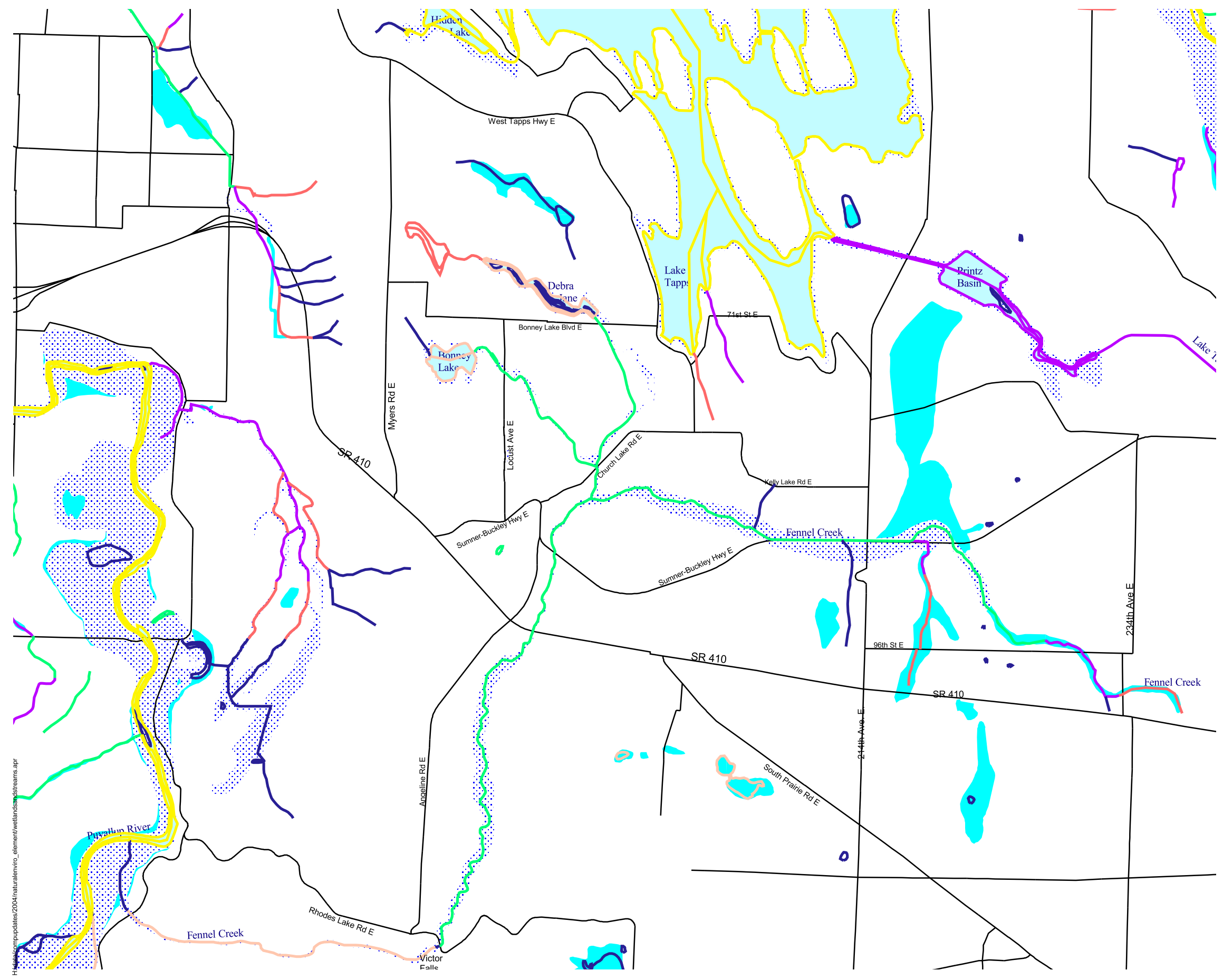


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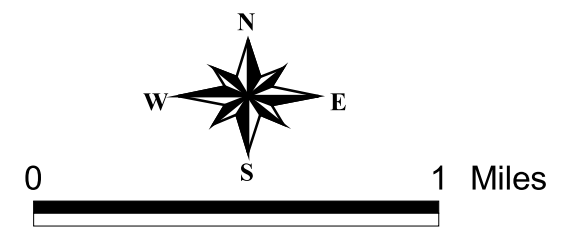
Bonney Lake Comprehensive Plan

STREAMS AND FLOOD HAZARD AREAS



- City boundaries
- Stream Types (DNR)***
- 1 (S)
- 2 (Absent in new system)
- 3 (F)
- 4 (Np)
- 5 (Ns)
- 9 (Unsurveyed)
- Flood Hazard Area: 100 yr floodplain (A zone from FIRM map)
- Flood Hazard Area: 500 yr floodplain (X500 zone from FIRM map)

* Some streams may only exist underground as a result of development/culverts



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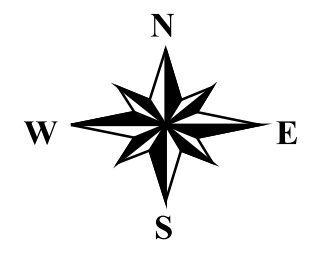
H:\GIS\mxd\2004\naturalenviro_elementalwetlandsstreams.apr



Bonney Lake Comprehensive Plan

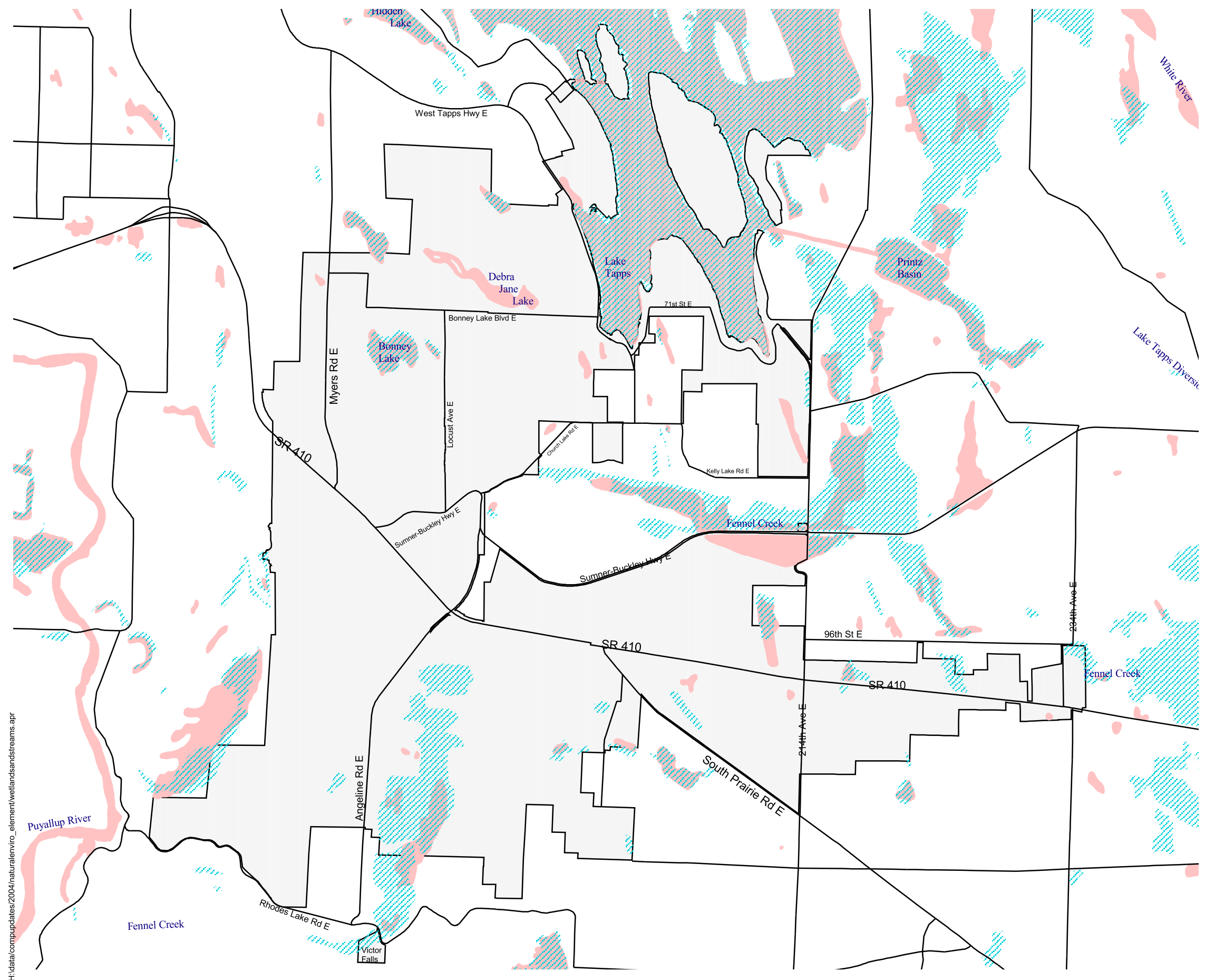
Wetlands

-  City boundaries
-  Wetlands-2002
-  County Wetland Inventory
-  Wetlands identified in '96 Plan
-  National Wetlands Inventory



0 1 Miles

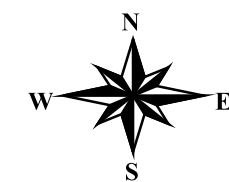
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Priority Species and Wildlife Habitat

-  City boundaries
-  Wildlife Heritage - Bird
-  Salmon - 2 species present
-  Chinook - Presence known
-  Riparian Corridor
-  Chinook-Critical/Depressed Status; Native Origin
-  Bald Eagle
-  Great Blue Heron
-  Waterfowl Concentrations



0  1 Miles

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Effective 2-2004

