PACIFIC CITY COUNCIL AGENDA
Council Chambers - City Hall. 100 3rd Ave. SE

May 4, 2015
Monday

Workshop
6:30 p.m.

1. CALL TO ORDER/PLEDGE OF ALLEGIANCE

2. ROLL CALL OF COUNCIL MEMBERS

3. ADDITIONS TO/APPROVAL OF AGENDA

4. DISCUSSION ITEMS

(2) **A. AB 15-057: Discussion: Comprehensive Plan Amendments:** (20 min.)
Revisions to Chapter 3 – Natural Environment Element
Revisions to Chapter 8 – Transportation Element
(Jack Dodge)

(187) **B. AB-15-068: Resolution No. 2015-252:** King County Flood District Flood Reduction Fund Application for financial assistance to open and close the park. (5 min.)
(Lance Newkirk)

5. ADJOURN

AGENDA ITEM NO. 4A

AGENDA BILL NO. 15-057

TO: Mayor/City Council

FROM: Jack Dodge, Community Development Manager

MEETING DATE: May 4, 2015

SUBJECT: Revisions to Chapter 3 – Natural Environment Element, Comprehensive Plan
Revisions to Chapter 8 – Transportation Element, Comprehensive Plan

ATTACHMENTS:

1. Draft Revision to Chapter 3, Natural Environment
2. Draft Revision to Chapter 8, Transportation
3. Revised Wetland Map
4. Lower White River Biodiversity Management Area (BMA) Stewardship Plan
5 Bioblitz Pacific – 2007
6. Letter of Support – American Rivers Organization, 3/24/15
7. Letter of Support – Tahoma Audubon Society, 3/16/15
8. Letter of Support – Puyallup River Watershed Council, 3/17/15
9. Letter of Support – Puyallup Tribe of Indians, 3/23/15
10. Comments/Response to Comments, Muckleshoot Indian Tribe, 3/20/15
11. March 24, 2015 – Draft Planning Commission Minutes

Previous Review Date: Planning Commission – 2/25/14, 2/24/15, 3/10/15, 3/24/15 (Public Hearing);
City Council: April 20, 2015

Summary:

<u>Background</u>

In January 2014 the City received a grant from the Dept. of Commerce for updates to the City's Comprehensive Plan. The contract called out for revisions to the following Chapters of the Comprehensive Plan.

- Chapter 3 – Natural Environment
- Chapter 8 – Transportation
- Chapter 10 – Capital Facilities

The grant also required a major overhaul to the City's "Critical Areas" regulations. Due to a variety of factors (staff shortages, administrative issues), no work on the Comprehensive Plan updates commenced until earlier this year. As a result, the City requested a revision to the "Scope of Work" that would require only the following updates.

- Chapter 3 – Natural Environment
- Chapter 8 – Transportation
- A revised "Critical Areas/Wetlands" map

This was due to mandatory deadlines to met State Environmental review requirements and Dept. of Commerce (DOC) review requirements. The change to the Scope of Work was approved by DOC.

Summary of Changes to the Natural Environment & Transportation Chapters

The proposed revisions to the Comprehensive Plan were reviewed at the 2/24/15, 3/10/15, and 3/24/15 Planning Commission meetings. Revisions to the Natural Environment and Transportation Chapters took into account comments from a variety of agencies and organizations. Revisions are highlighted with ~~strikeouts~~ and underlines. Comments were provided from the following:

- American Rivers Organization
- Tahoma Audubon Society
- Puyallup River Watershed Council
- Puyallup Tribe of Indians
- Muckleshoot Indian Tribe

Following is a summary of the changes to the Natural Environment and Transportation chapters.

Chapter 3 - Natural Environment

- The Chapter has been reformatted to a single column format.
- Removes Goal NE-2 (Page 3).
- Provides additional discussion points for a variety of policies.
- Adds policy NE 5.8 regarding "Best Available Science" (BAS) (Page 9).
- Deletes Policy NE-8.3 (Page 12).
- Adds a new Policy NE-7.5 regarding volcanic hazard evacuation routes (Page 12).
- Adds new Goals and Policies relating to "biodiversity" (Page 14).
- Provides greater detail under "Existing Conditions".
- Provides background regarding the Lower White River Biodiversity Management Area (BMA) (Page 24).
- Adopts the "Lower White River Biodiversity Management Area (BMA) Stewardship Plan" as an appendix to the Comprehensive Plan (Natural Environment Chapter).
- A new "Soils" map is provided (Map 3.1).
- A new "Creeks/Streams" map is included (Map 3.2).
- A new "Wellhead Protection Area" map is provided (Map 3.3).

- A new "Lahar Hazards" map is provided (Map 3.4).
- A revised "Critical Areas" map is provided (Map 3.5). This map updates the location of potential wetlands as of March 2015.

Chapter 8- Transportation

- The Chapter has been reformatted to a single column format.
- Goal T2 and Policy T2.1 are deleted (Page 6).
- Goal T13 is deleted (Page 18).
- Goal T18 is deleted (Page 25).
- Policy T20.3 is deleted (Page 27).
- "Discussion" statements are provided for all policies.
- The "Existing Roadway Level of Service (LOS) table is revised (Table 8.2, Page 33).
- 2025 projected roadway LOS levels are provided (Table 8.3, Page 37).
- 2035 projected roadway LOS levels are provided (Table 8.4, Page 339).
- Background data is updated.
- A new "Traffic Counts" map is provided that is keyed to Tables 8.2, 8.3., and 8.4.

Planning Commission Recommendation

The Planning Commission has reviewed the proposed revisions over three separate meetings. At the Commission's March 24, 2015 public hearing, the Planning Commission voted to recommend approval of the revisions to Chapter 3 – Natural Environment and Chapter 8 – Transportation.

Recommended Action:

1. Begin initial discussion of the revisions to the Natural Environment and Transportation Chapters.

2. Continue discussion of the proposed revisions at the April 27th Council Meeting

3. Set a public hearing date on May 11, 2015 to take additional public comment regarding the proposed revisions and make a decision to adopt, adopt with revisions, or not adopt the proposed changes to the Comprehensive Plan.

Recommended Motion:

I move that the City Council set a public hearing date for May 11, 2015 to gain additional public input on the proposed revisions to Chapter 3 – Natural Environment and Chapter 8 – Transportation of the Comprehensive Plan.

CHAPTER 3

NATURAL ENVIRONMENT

1. INTRODUCTION

1.1 Framework Goal

The first Framework Goal of this Comprehensive Plan is to:

> *Provide an effective stewardship of the environment by protecting critical areas and conserving land, air, water, and energy resources.*

The purpose of the Natural Environment element is to guide the formation of regulations to protect and enhance the natural environment for present and future citizens of Pacific. This protection will be accomplished by:

- Identifying critical areas and updating maps;
- Updating the Critical Areas Ordinance and the Shoreline Master Program;
- Preserving or enhancing significant natural areas;
- Regulating new development to better integrate the built environment with natural features and conditions, and;
- Educating the public about the potential impacts of development on natural systems.

This element provides a framework for achieving land use and development practices that are compatible with and enhance the natural environment.

1.2 Objectives of the Growth Management Act and of Other Agencies

The Natural Environment element is intended to meet the objectives of the State Growth Management Act (GMA); Endangered Species Act (ESA); State Environmental Policy Act (SEPA); Countywide Planning Policies of King and Pierce counties; and other federal, state, and county policies. It also affirms the City's role in regulating land use; implementing federal and state statutes; obtaining funding from federal, state and local jurisdictions; and consistently managing impacts to the natural environment. The following GMA goals relate directly to the natural environment:

- Open space and recreation - Retain open space, enhance recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities.

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

The GMA also requires adoption of development regulations that protect critical areas (RCW 36.70A.060), and use of the "best available science" in developing policies and development regulations to protect the functions and values of critical areas (RCW 36.70A.172).

1.3 Background and Context

The original environment of Pacific was a river valley covered with old growth forests that experienced seasonal flooding. Today, Pacific is largely composed of built features that are being redeveloped for the second or third time since the City's incorporation in 1909. Most of the original natural environment has been compromised.

Pacific was a rural agricultural town of under 1,577 people in 1960. The population of Pacific grew by nearly 70 percent to 2,261 in 1980, and more than doubled to 5,527 persons between 1980 and 2000. By 2010, Pacific's population reached 6,606 persons. The 2014 population estimate is 6,830 (Based on the Office of Financial Management estimates). This was just one result of highway regional transportation facilities directing growth into the White River valley, combined with the availability of sewers in Pacific. As pressure for increased residential and commercial development intensifies from both the north and south, the protection or enhancement of the natural environment becomes more challenging.

This City must continually evaluate the relationship between the natural and built environments. Potential impacts of development on slope stability and erosion; air, water, and soil contamination; noise, emissions, and waste generation; resource consumption; and automobile dependence need consideration; along with the preservation and enhancement of open space, wildlife habitat, and recreation opportunities.

Environmental goals, objectives, and policies contained in this element address substantive issues, such as potential development on wetlands, floodplains, and steep slopes. These policies not only outline steps the City should take towards establishing policy direction and regulatory authority on environmental issues, ~~but~~ ~~procedures~~ they help to guide the property owner and citizen. One example of this is to encourage the combining of storm water storage areas to create more viable natural areas, instead of creating a patchwork of small detention ponds.

These goals and policies will be implemented through such measures as: sensitive area regulations, development review guidelines, storm water ordinances and programs, economic incentives for environmental protection, and economic development decisions.

2. GOALS AND POLICIES

REGULATORY CONSIDERATIONS

GOAL NE-1: Respect and protect the natural environment in any future development.

POLICIES

Policy NE-1.1: PROTECTION OF CRITICAL AREAS
Enact regulations and ordinances to protect natural resource lands and critical areas, including the streams and rivers, wetlands, slopes, groundwater recharge areas, watersheds, forest lands and other critical resource areas from the detrimental effects of development.

Discussion: Implement regulations that not only protect, but enhance the natural environment, and compliment the economic development of the community. This can only be accomplished by informing citizens and property owners of the standards which the City maintains to create a safe and stable community.

~~**GOAL NE-2: Lead and support efforts to protect and improve the natural environment.**~~

Policy NE-~~2~~1.~~1~~2:
Take a proactive role in addressing issues of the Endangered Species Act (ESA).

Discussion: The City will enforce federal, state, county, and City environmental policies and regulations to advance the goals of the ESA and encourage unique innovative approaches to issues that may impact salmon-bearing streams.

Policy NE-~~2.2~~ 1.3:
Consider and evaluate the immediate, long-range, and cumulative environmental impacts of policy and development decisions.

Discussion: The City should look carefully at both long-term and cumulative impacts when making such decisions. These considerations should be evaluated as part of the environmental review of the policy and development decisions.

Policy NE-~~2.3~~ 1.4:
Encourage the use of a variety of technologies that minimize environmental degradation and protect public health.

Permeable Pavers - Photo by Collen Owen

Discussion: In working with developers, the City has a wide variety of possible options available to mitigate the impacts of new development. Options include the use of "Low Impact Development" (LID) techniques to mitigate the impacts to the environment due to new development. Options such as the use of permeable pavers in parking areas could be used. ~~For example, the use of vegetation or grinding of sewage may allow for more development than would be otherwise allowed for certain areas~~. The City can implement this policy by revising its codes to recognize options for complying with regulations and mitigating environmental impacts. Technical manuals regarding LID development can be found on the Washington State Department of Ecology (DOE) website and the King County website under the Department of Permitting and Environmental Review. It should be noted that LID techniques do not completely mitigate impacts on fishery resources.

Policy NE-~~2.4~~ 1.5:
Conduct all City operations in a manner that minimizes adverse environmental impacts and promotes a safe workplace for employees.

Discussion: The City can implement this policy by reducing its consumption and waste of energy and materials, minimizing its use of toxic and polluting substances, reusing and recycling, and disposing of all

waste in a safe and responsible manner. The City should give preference to recycled products, within budget constraints.

Policy NE-~~2.5~~1.6:
Support, promote, and lead public education and involvement programs.

Discussion: Public education and involvement raises public awareness about environmental issues, and encourages individual and Community efforts to protect the environment.

Policy NE-~~2.6~~1.7:
Cooperate with local, state, federal, and tribal governments; international agencies, business groups, and non-profit organizations to protect and enhance the environment.

Discussion: Many environmental issues affect areas beyond Pacific's boundaries. The City needs to negotiate, communicate, and cooperate with other organizations in order to address these issues. The City should also participate in local and regional programs to protect environmentally sensitive areas.

ENVIRONMENTAL ENHANCEMENT

GOAL NE-~~3~~2: Enhance the natural environment in the community.

POLICIES

Policy NE-~~3~~2.1:
The following shall be considered critical areas and regulated through the Pacific Municipal Code: critical wildlife habitat areas, flood and landslide hazard areas, steep slopes, streams, and wetlands.

Discussion: Title 23 of the Pacific Municipal Code (PMC) defines the categories of critical areas and specifies how each category will be regulated.

Policy NE-~~3~~22:
Enhance and facilitate not only the preservation, but the coordinated restoration and/or creation of new critical areas, as part of the planning process.

Discussion: Title 23 of the Pacific Municipal Code (PMC) outlines mitigation for development in or around wetlands. These regulations not only outline the degree of mitigation required but also outline ratio's to create new wetlands as necessary. These ratio's should be reviewed annually to ensure they conform with the latest recommendations by the Department of Ecology (DOE).

Policy NE-~~3~~2.3:
Provide incentives for development that is designed, sited, and constructed to minimize environmental impacts.

Discussion: Incentives may include density bonuses for cluster development, open space tax incentives, incentives for design, and a transfer of development rights (TDR) program. Incentives may also include reduced mitigation requirements in exchange for reduced impacts.

Policy NE-~~3~~2.4:
Require mitigating measures for new development that creates environmental impacts.

Discussion: Mitigation measures should be appropriate for the type of impact and proportionate to the amount of impact. They may involve the retention or restoration of significant habitats or other critical areas. They can also include the construction or improvement of private capital facilities.

Policy NE-~~3~~2.5:
Encourage private open space preservation in the City.

Discussion: The encouragement of open space preservation could be achieved though density credits and criteria that connect open space corridors with adjoining properties within the City. Such corridors could help facilitate the migration of wildlife from one area of the City to another.

SURFACE WATER MANAGEMENT

GOAL NE-~~4~~3: Encourage measures that improve surface water management.

POLICIES

Policy NE-~~4~~3.1:
Prohibit development in areas where frequent surface flooding occurs, unless adequate engineering and institutional controls are implemented.

Discussion: Structures built within flood hazard areas decrease flood storage capacity. Increasing building density in these areas generally results in a larger area threatened by seasonal flooding. The City may require a "no net loss" approach to maintaining floodwater storage capacity.

Policy NE-~~4~~3.2:
Continue development review for surface water compliance. All costs associated with surface water review shall be recovered from development applicants.

Discussion: Surface water review is needed to ensure that the use of one property does not unreasonably infringe upon the use of neighboring properties. Surface water can be retained on site or managed through community surface water systems.

Policy NE-~~4~~3.3:
Require appropriate engineering and institutional controls for development in flood hazard areas.

Discussion: Proper controls will help alleviate impacts to future property owners who reside in Pacific. These controls should meet the requirements of the Federal Emergency Management Agency (FEMA).

Policy NE-~~4~~3.4:
Ensure that erosion control measures function during and after construction, and that approved surface water management and septic systems are installed by conducting routine building and development review inspections.

Discussion: Proper erosion control measures will help to ensure that storm drainage will not impact existing and proposed development located on our adjacent to the property. Inspections of these facilities are necessary to determine that these measures are adequately maintained to the specifications required of the construction of the erosion control facilities.

Hillside Erosion

WETLANDS PROTECTION

GOAL NE ~~5~~4: Provide for the protection of wetlands.

POLICIES

Policy NE-~~5~~4.1:
Implement a ranking and classification system for wetlands which rates wetlands based on size, vegetative complexity, ecological and hydrological function, and presence of threatened or endangered species.

Discussion: Work with neighboring jurisdictions to establish a consistent regional classification system for wetlands that allows for the designation of both regionally important and locally unique wetlands. This system should incorporate the latest state Department of Ecology's wetland rating criteria.

Policy NE-~~5~~4.2:
Identify and classify the diverse functions and values of wetlands in the City.

Discussion: The City can implement this policy by identifying all wetlands on public property and establishing a voluntary program to identify wetlands on private land, as well as requiring wetland studies of potential wetlands as development is proposed.

Policy NE-~~5~~4.3:
Achieve "no net loss" of wetland acreage, functions, and values within each drainage basin over the long term.

Discussion: "No net loss" means that total wetland acreage, functions, and values are preserved over the long term. The City should:

- Encourage educational opportunities that increase public understanding and appreciation for the values of wetlands;
- Advise citizens of measures they could take to maintain wetlands on their properties.
- Consider off-site mitigation for wetlands, such as creating a new wetland, only within the same drainage basin.

Policy NE-~~5~~4.4:
Existing degraded wetlands should be restored where practicable, or consolidated in a drainage basin plan.

Discussion: Restoration of degraded wetlands, or participation in a community-wide mitigation planning program, may be required as a condition of new development or redevelopment. The City should consider creating a "mitigation utility" to implement a neighborhood plan.

FISH AND WILDLIFE HABITAT PROTECTION

GOAL NE ~~6~~5: Protect fish and wildlife habitat and native vegetation.

POLICIES

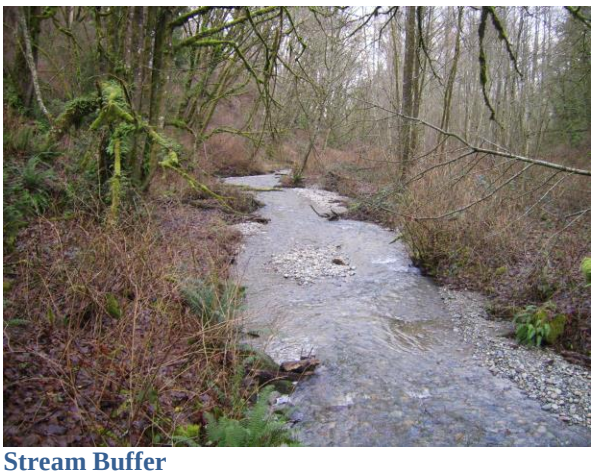
Policy NE-~~6~~5.1:
Develop a vegetation preservation and enhancement program.

Discussion: Vegetation in the City of Pacific provides and protects habitat for fish and wildlife. Vegetation also plays an important role in surface water management and stabilizing soils in critical areas. The City can preserve and enhance vegetation through some of the following methods:

- Encourage the use of native vegetation as an integral part of development plans.
- Limit the removal of healthy trees in critical areas and critical area buffers.
- Encourage the use of native and low maintenance vegetation in residential and commercial landscapes.
- Require tree replacement on private property as project mitigation.
- Replace removed trees on public land.

Policy NE-~~6~~5.2:
Implement measures to provide appropriate protection of fish and wildlife habitat.

Discussion: Fish and wildlife have similar needs as humans. They need clean water, fresh food and clean safe habitat area to raise their young. For fish, this means that there is an adequate supply of clean cool water. This can be provided through the retention of shading vegetation on the banks of streams and rivers. Clean water can be retained through stormwater control structures that remove sediment and pollutants. Streamside vegetation can also provide safe habitat through the provision of hiding places for adult and juvenile fish.



Stream Buffer

Policy NE-~~6~~5.3:
Plan for and protect wildlife corridors as part of an open space and parks master plan.

Discussion: Maintenance of wildlife corridors provides feeding areas and escape routes for animals. The City can implement this policy through public education, land use designations, incentives, regulation, and code enforcement.

Policy NE-~~6~~5.4:
Actively participate in regional species protection efforts, including salmon habitat protection and restoration.

Discussion: The City will implement this policy by working with citizen volunteers, county, state and federal agencies, and tribal governments to identify, prioritize, and eliminate barriers to anadromous fish spawning and rearing habitat.

Policy NE-~~6~~5.5:
Protect and enhance critical wildlife habitat and, where practical, preserve existing wildlife habitat.

Discussion: Critical wildlife habitat refers to areas identified as priority habitats by the Washington Department of Fish and Wildlife or by the City of Pacific. The City can implement this policy through regulation, code enforcement, acquisition, incentives, and other techniques.

Policy NE-~~6~~5.6:
Establish buffers to preserve aquatic and riparian habitats in a natural state.

Discussion: Buffers around wetlands, lakes, creeks, ditches, and streams protect native vegetation, water quality, habitat for fish and wildlife, and hydrologic function. They provide greater areas of habitat for fish and wildlife, and natural undisturbed areas for public enjoyment.

Policy NE-~~6~~5.7:
Prohibit alterations to streams unless they are part of approved restoration efforts.

Discussion: Stream alterations, such as filling or redirection of a watercourse, are likely to result in adverse impacts to the natural environment. Impacts can include sediment transport and flooding on adjacent properties. Where practical, streams should be allowed to return to natural channel migration patterns. The City will implement this policy through code enforcement.

Policy NE 5.8:
Incorporate the use of "Best Available Science" (BAS) when typing the creeks/streams within the City of Pacific.

Discussion: The use of "Best Available Science" (BAS) is necessary to ensure the proper typing of streams in Pacific. The use of experts in the field of fishery resources can provide the needed expertise to meet the BAS requirements under the GMA. A joint effort between the City of Pacific, City of Sumner and the Muckleshoot Indian Tribe should be considered to conduct a stream assessment of Milwaukee

Creek, the Government Canal (Boeing Creek) and other unnamed tributaries to the White River in Pacific and Sumner.

WATER QUALITY

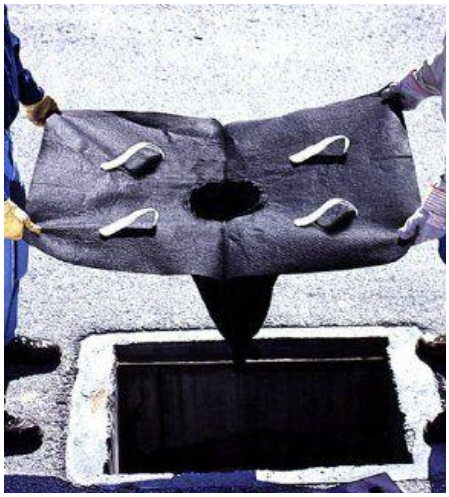
GOAL NE ~~7~~6: Preserve and enhance water quality.

POLICIES

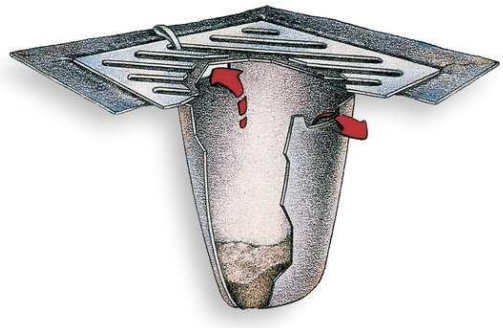
Policy NE-~~7~~6.1:
Prevent pollution of both surface and groundwater resources.

Discussion: Whether it is located in streams, wetlands, or underground sources of water supply, clean water is one of Pacific's important characteristics. The City can ~~protect~~ minimize surface and groundwater ~~resources~~ impacts through some of the following methods:

- Control development in areas of high water table.
- Encourage the retention of vegetation along waterways.
- Reduce or control surface water runoff from paved and other impervious surfaces.
- Encourage the use of properly designed ditches and swales.
- Encourage innovative ditch maintenance activities, such as the rotation of segments for ditch cleanings in adjacent areas.
- Require the use and maintenance of sedimentation traps and filters to prevent the movement of silt and other materials into the surface water system. This could be done using catch basin inserts that help filter out sediments and pollutants from street and parking lots.



Catch Basin Insert



Catch Basin Insert

- Emphasize public education on how to maintain water quality.
- Consider water quality issues in planning for parks and open space.

Policy NE-~~7~~6.2:
Work with neighboring jurisdictions and other agencies and organizations to enhance and protect water quality in the region.

Discussion: Enhancing and protecting clean water throughout a watershed often requires joint efforts between jurisdictions. For example, preserving water quality in the City of Pacific will have a positive impact on the water quality of the White/Stuck River, and the Cities of Algona, Auburn, and Sumner.

Policy NE-~~7~~6.3:
Protect areas that are critical for aquifer recharge.

Discussion: Recharge occurs via slow percolation through soils. Areas of highly permeable soil are vulnerable, and the potential for contamination of perched groundwater is greater in these areas. Planning should consider the types of development permitted in certain areas of the City. For example, a gas station or an industrial site with potential contaminants could pose a significant risk in certain permeable soils.

Policy NE-~~7~~6.4:
Actively pursue funding for baseline monitoring and improvement of water quality in waterways in the City, with waterways connected to salmon-bearing waters receiving priority funding.

Discussion: Funding could be obtained through the Washington Wildife Recreation Program (WWRP) administered through the Washington State Recreation and Conservation Office (WRCO). This funding is a 50% match grant with at least 10% of the total project cost from a non-state, non-federal contribution .

EARTHQUAKES, STEEP SLOPES AND VOLCANIC HAZARDS

GOAL NE ~~8~~7: Reduce potential hazards associated with earthquakes, ~~and~~ steep slopes and volcanic hazards.

POLICIES

Policy NE-~~8~~7.1:
~~The City~~ ~~r~~Require~~s~~ appropriate standards for site development in areas with moderate and steep slopes, based upon site specific information.

Discussion: Development review for buildings on slopes requires site specific information on soil type and water content, as well as the degree of slopes. Development on steep slopes causes impacts to surface water, may cause erosion of soils, and increased the probability of landslides. Mitigating measures for such development can include clustering development, decreasing the amount of impervious surface, the planting trees and other vegetation and the use of appropriate erosion control measures.

Policy NE-~~8~~7.2:
Regulate land clearing and other significant removal of vegetation on steep slopes in identified landslide hazard~~s~~ areas.

Discussion: The City will implement this policy through a critical areas or significant tree ordinance, and/or applicable development regulations. These areas will be identified as part of any geotechnical studies that are required for new development.

~~**Policy NE-83:**~~
~~*Require mitigating measures for new development on steep slopes.*~~

~~***Discussion:*** Development on steep slopes causes impacts to surface water, erosion, and increased probability of landslide hazards. Mitigating measures for such development can include clustering development, decreasing the amount of impervious surface, or planting trees and other vegetation.~~

Policy NE-~~8~~7.~~4~~3:
Enforce building codes to minimize the risk of structural damage, fire, occupant injury, and prevent post-seismic collapse in areas subject to severe seismic hazard.

Discussion: The best available methods should be used to identify and evaluate seismically hazardous areas. Requiring appropriate soil analysis and construction methods can minimize the hazard and avoid seismic-related structural damage and injuries.

Policy NE-~~8~~7.~~5~~4:
Promote educational efforts to inform landowners about site development, drainage, and yard maintenance practices that impact slope stability.

Discussion: Washington State Department of Ecology Publications 93-30, 93-31, and 95-107 are resource materials that also will be utilized for this purpose.

Policy NE-7.5:
Identify volcanic hazards evacuation routes from the lowland areas of Pacific to upland areas.

Discussion: Pacific is located within the "volcanic hazard zone" of Mt. Rainier. A lahar from Mt. Rainier inundated the area of Pacific approximately 500 years ago. Should Mt. Rainier become more active in the future, another lahar may reach the City. Signage identifying evacuation routes should be located at Jovita Boulevard E., 58th Pl. S., 56th Pl. S. and Peasley Canyon. This will give residents and visitors direction to escape potential future lahars.

AIR QUALITY

GOAL NE ~~9~~8: Protect and improve local and regional air quality by reducing or eliminating sources of air pollution.

POLICIES

Policy NE-~~9~~8.1:
Encourage the use of landscaping and the retention of existing vegetated areas to provide ~~for~~ filtering of suspended particulates.

Discussion: Retention of trees and other vegetation is vital to maintaining good air quality. Vegetation filters out suspended particles and purifies the air.

Policy NE-~~98~~.2:
Encourage non-motorized and public transportation and provide opportunities for reduced automobile travel.

Discussion: Vehicle emissions are a major local source of air pollution. Reducing the number of trips made by motor vehicles will reduce emissions. The City can implement this policy by encouraging non-motorized transportation projects in capital facilities programs, and by providing in the zoning ordinance for development of Park & Ride lots in the Neighborhood Center and mixed use areas to reduce vehicular trips. This, together with encouraging carpooling, will result in less vehicles and emissions.

Policy NE-~~98~~.3:
Support federal, state, and regional policies intended to protect clean air in the Puget Sound area.

Discussion: State and regional agencies, such as Puget Sound Air Pollution Control Agency, the Puget Sound Regional Council, and the Washington State Department of Transportation, generally administer air quality regulations. The City will implement this policy by working with these agencies and by supporting public education regarding these issues.

Policy NE-~~98~~.4:
Consider the use of road treatments such as roundabouts and traffic circles to reduce the need for stop signs and traffic signals.

Discussion: The City may wish to investigate the impact of roundabouts and traffic circles on vehicle emissions, in comparison to traffic signals and stop signs.

NOISE AND GLARE

GOAL NE ~~10~~9: Minimize excessive noise and light emitted from commercial and industrial land uses, and new construction.

POLICIES

Policy NE-~~10~~9.1:
Reduce, and where possible, eliminate problems associated with major noise and light generating uses, especially those located near residences. Establish standards for noise and light generating land uses that address acceptable amounts of noise, light, and time and frequency of activities.

Discussion: Natural or manmade barriers should be placed between noise and light sources and residential land uses. Trees and natural vegetation should be retained along the perimeter of new subdivisions and along arterial streets to filter noise and light. Light shields can be used for building lighting and parking lots. This would help to mitigate the impacts from commercial and industrial development on adjacent residential areas. Noise and light control ordinances shall be enforced.

BIODIVERSITY

GOAL NE-10: Protect biodiversity along the White River in Pacific

POLICIES

Policy NE-10.1:
Finalize, implement actions, and track progress of the Lower White River Biodiversity Management Area (BMA) Stewardship Plan.

Discussion: The Lower White River BMA Stewardship Plan is a nonregulatory plan that can be used to guide the City to protect its biodiversity in coordination with new development. The City should adopt the plan for guidance as an appendix to the Comprehensive Plan.

Policy NE-10.2:
Identify partners and volunteer citizen groups who can advance the Lower White River BMA Stewardship Plan.

Discussion: The City should partner with the Pierce County Biodiversity Alliance (PCBA) and the Friends of the Lower White River. Partnering with the PCBA and Friends of the Lower White River will help to develop region wide cooperation in protecting the biodiversity of the Lower White River.

Policy NE-10.3:
Coordinate with other jurisdictions within the Lower White River BMA (Sumner, Auburn, Buckley, Pierce County, King County, Muckleshoot Tribe of Indians) and meet periodically to align goals, objectives and strategies, and monitor progress.

Discussion: Coordinating with other jurisdictions will be necessary to preserve the biodiversity of the Lower White River BMA. Without this coordination, potentially conflicting policies or regulations may result that could impact the biodiversity of the Lower White River BMA.

3. EXISTING CONDITIONS

Pacific is known to have the following critical or sensitive, areas: landslide hazard areas, erosion hazard areas, seismic hazard areas, flood hazard areas, lahar hazard areas, steep slopes, streams, wetlands, and critical wildlife habitats including the "Lower White River Biodiversity Management Area". Many of these features have been identified and mapped, but mapping to date is known to be incomplete.

Features that meet sensitive area definitions are regulated as Critical Areas. Ordinance No. 1187 established Pacific Municipal Code (PMC) Title 23, "Critical Areas Management" in 1992. Ordinance No. 1505 amended sections of this title as part of a Development Regulations update in 2001. Additional amendments to Title 23 were made under Ordinance 1557 in 2004 and Ordinance 1639 in 2006. Further review of the Critical Areas Regulations under Title 23 will be necessary to determine additional amendments necessary to conform with current State and Federal requirements for Critical Area protection. The Comprehensive Plan Update will guide further revisions in accordance with federal, state, and King County and Pierce County Countywide Policies, where applicable.

3.1 Geographical Context

The City of Pacific is located in both south central King County and north central Pierce County. It is primarily a lowlands area of the White River Valley, but also includes a portion of the Jovita Heights uplands on the west. With the incorporation of the City of Edgewood to the southwest in early 1996, and the City of Sumner's northern annexation to Pacific's southeast King County line in 2002, the City of Pacific became surrounded by other incorporated cities. The City of Sumner is located to the south and east, Edgewood to the west, Algona to the north, and Auburn to the northeast and east.

Jovita Heights is an area of approximately 218 acres abutting the City of Pacific's western edge in unincorporated King County. It is an urban growth area (UGA) for the City. A land sliver of about 6.6 acres between West Valley Highway and SR 167 is the City's western Pierce County UGA. Another isolated portion of unincorporated Pierce County, consisting of less than 30 acres, abuts Pacific on the east from the King County Line to just above Stewart Road. It meets the northwestern boundary of Sumner ~~in the middle~~ on the left bank of the White/Stuck River channel. These comprise the City of Pacific's UGAs.

3.2 Topography and Geology

3.2.1 Topography

Most of Pacific lies in the valley of the White/Stuck River. The majority of the City is relatively flat to gently rolling. Steep slopes in excess of 30% rise to in the west and to the east of Pacific. The valley extends the length of the City from north to south. The White/Stuck River flows through the northeast corner of Pacific in King County, heading south along the City's eastern border into Pierce County. The valley floor of the City is relatively low, with an average elevation of approximately 70 feet above sea level.

3.2.2 Geology

Soils

The load-bearing capacity of soil, the hydric properties, erosion potential, and characteristics with respect to shrink-swell potential all play a significant role in the development of land. In particular, the hydric properties indicate the existence of wetlands, and signal the potential for other environmental concerns.

Soil types in the City and its Urban Growth Area (UGA) include:

- Ag – Alderwood gravelly sandy loam
- Br – Briscot silt loam
- Ev – Everett gravelly sandy loam
- In – Indianola loamy fine sand
- Ma – Mixed alluvial land
- No – Norma sandy loam
- Os – Oridia silt loam
- Py – Puyallup fine sandy loam
- Re – Renton silt loam
- Sk – Seattle Muck
- Sm – Shalcar Muck
- So – Snohomish Silt loam
- Tu – Tukwila muck
- Ur – Urban land

A composite soil map based on a 1973 King County Soil Survey and 1939 Pierce County Soil Survey, updated in 2000, also indicates some topographical features. The map is included at the back of this element (See Map 3.1).

3.3 Water

3.3.1 Surface Water

White River

Rivers and other surface waters are important resources. The quality of water is crucial to the entire river habitat. Reduction in water quality will not only degrade the environmental and scenic value of the river, but may also threaten the ground water that is the source of potable water for residents of the Pacific planning area.

The White River originates on Mount Rainier and flows generally west along the King-Pierce County line through Buckley and Auburn, before turning southwest to become the White/Stuck River in Pacific. Further south in Sumner the White/Stuck empties into the Puyallup River. The surface water and river habitat quality are generally good. However, provisions for new development must protect against contamination and soil erosion, and prevent processes that would strip crucial wildlife habitat or change the flow of the river in ways which damage the viability of the ecological system.

The City also contains streams/creeks that are tributary to the White River. These streams/creeks include Milwaukee Creek and Government Canal (Boeing Creek). These streams/creeks are shown on Map 3.2.

Following is a Table providing the Department of Natural Resources (DNR) stream typing of the creeks in Pacific.

DNR Stream Type	**Streams of This Type in Pacific**
Type S (subject to Shorelines Management Act)	• White/Stuck River
Type F (fish-bearing other than S)	• Jovita Creek • Milwaukee ~~Ditch~~ Creek south of 5th Ave. S.W.
Type Np (nonfish, perennial)	• Milwaukee ~~Ditch~~ Creek, middle portion • Government Canal (Boeing ~~ditch~~ Creek)
Type Ns (nonfish, seasonal)	• Milwaukee ~~Ditch~~ Creek east of Tacoma Blvd.

The DNR stream typing is based upon the "Forest Practices Application Review System" (FPARS). Within urban areas, the DNR stream typing may not have been field verified. As development occurs adjacent to streams and creeks in the City, additional studies should be required by development to verify the stream/creek classification. To ensure the most complete "Best Available Science" (BAS) to determine a stream type, the City should explore partnering with the City of Sumner and the Muckleshoot Tribe to apply for grant funds to conduct a comprehensive stream assessment of the City's streams & creeks. This includes Milwaukee Creek to its confluence with the White River in Sumner, the Government Canal (Boeing Creek), and other unnamed creeks.

3.3.2 Groundwater

Precipitation is dispersed in three ways. Some of the water enters the surface runoff through a system of ditches and streams. Some of it is intercepted by plant life or is bound up by molecular soil activity. The rest percolates down to recharge water bearing soil layers and is either intercepted by wells, or is discharged to the surface again through springs, seeps, and streams. From there, it reenters the atmosphere by evapotranspiration, then condenses and eventually precipitates as rain to complete the hydrologic cycle.

Groundwater is surface water that has filtered down through the soil to saturate permeable subsurface layers of gravel, sand, or porous rock. An integral component of this cycle, groundwater is also the entire source of the potable water supply for residents of the Pacific planning area. The source of supply for Pacific's groundwater is the thick White River fan, with its apex near Auburn, consisting of deposits of pebble-cobble gravel and sand. This thick fan is fed directly from the River and has a gravel aquifer in between to act as an infiltration medium. The City's aquifer recharge is potentially influenced by any processes in the White River watershed that might affect water quality downstream.

Critical Aquifer Recharge Area: As defined by PMC 23.~~08.020~~.10.030, this ~~is~~ "means an area with a critical recharging effect on aquifers used for potable water, as discussed in WAC 365-190-080(2). Within such areas, pollutants seeping into the ground are likely to contaminate the water supply". It is critical that this potable water source be protected from point-source contamination ~~such as that from~~ including but not limited to; landfills, lagoons, dumps sites, storm water retention/detention ponds, chemical spills, septic tanks, and injection wells (Map 3.3). The aquifer must likewise be protected from non point-source contaminants such as agricultural and residential pesticides.

Rainfall and topography have an impact on groundwater quantity and rate of flow. Man-made developments also impact groundwater, by cultivating land, removing vegetation, or compacting soil. Groundwater impacts such as hazardous waste and pollutants are detrimental to the groundwater supply, and affect its quality for years.

Impervious area is a measure of the percentage of area covered by roofs, streets, sidewalks, driveways, etc. Any future development will increase these impervious areas. Increased impervious area can result in decreased groundwater recharge. Even lawn areas allow only a fraction of the groundwater infiltration permitted by natural forest cover. Since a larger percentage of the precipitation volume is going directly to runoff, there is less available surface water for soil moisture replenishment and groundwater storage.

The Growth Management Act (GMA) requires that cities and counties identify and regulate these "areas with a critical recharging effect on aquifers used for potable water." Land uses and densities in these areas can affect the quality of the groundwater. Aquifer recharge areas exist throughout the City. Studies have not been conducted to determine the exact locations of critical recharge areas.

The City contains many observed springs and seeps along the hillsides to the east, west, and southwest from the upland plateaus, which attests to one or more water-bearing zones above the valley floor.

The City's ~~1998~~ 2010 Water System Plan included the consideration of wellhead protection, susceptibility (potential for groundwater recharge), and wellhead vulnerability (relationship between recharge potential and overlying contaminating land uses). ~~A 2002 amendment of the Water Plan to facilitate the assumption of the Webstone Water District has been approved by the Washington State Department of Health (DOH). The Water Plan is summarized in the Capital Facilities chapter of this Comprehensive Plan.~~

3.4 Climate

The climate of the Puget Sound Region is considered a typical maritime climate. The City of Pacific experiences cold, damp winters, cool damp spring and fall seasons, and moderately warm summers. The average precipitation is 39 inches annually, with the majority of the rain falling during the winter and spring months. The average annual temperature for the area is 51 degrees Fahrenheit. The local weather patterns and the relatively long growing season are ideal for vegetative growth.

Great Blue Heron

3.5 Vegetation, Fish, and Wildlife

3.5.1 Vegetation

Undisturbed riparian and wetlands-oriented vegetative canopy typically includes Western Red Cedar, Western Hemlock, Red Alder, Black Cottonwood, Big-leaf Maple, and species of Willow. Where this canopy has been disturbed, Reed Canary grass tends to dominate. These same canopy elements are present along the wooded slopes where the many seeps, springs, and surface rills provide sufficient moisture. Douglas fir tends to dominate the drier portions of these hillsides. The vegetative canopy is an

essential component of the diverse biological network crucial to the survival of wildlife species.

3.5.2 Fish and Wildlife

Fish and Wildlife Habitat Areas are those lands identified as being of critical importance to the maintenance of fish, wildlife, and plant species, including areas where endangered, threatened, and sensitive species have a primary association (such as Chinook Salmon and Bull Trout); habitats and species of local importance; naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat; waters of the State (White/Stuck River); lakes, ponds, streams, and rivers with natural fish stock and planted with game fish by a governmental, tribal entity, or private organization; and state natural area preserves and natural resource conservation areas.

Spawned-out Salmon - White River

The process of urbanization and redevelopment results in the conversion of wildlife habitat to other uses. The loss of certain types of habitat has been significant in Puget Sound, resulting in adverse effects on the health of certain species. These types of habitat are referred to as "critical wildlife habitats." Critical wildlife habitats include lands important for the protection, management, or public enjoyment of certain wildlife species. These include habitats for species designated by state or federal agencies as endangered, threatened, sensitive, candidate, or priority species.

Other critical natural resources include anadromous fish (those that migrate from the ocean to spawn) habitat; waterfowl and raptor nests; heron rookeries; and habitats of local importance that are identified and designated through a wildlife conservation plan.

The principle Fish and Wildlife Habitat areas within the Pacific planning area are the White/Stuck River floodplain and its associated stream reaches and riverine wetlands, the Milwaukee ~~Ditch~~ Creek, Trout Lake and its associated wetlands, and the steep wooded slopes that form the east and west walls of the valley floor. The White River riparian corridor supports diverse populations of insects, fish, birds, waterfowl, and fur bearing wildlife. Primary fish populations include Chinook, Coho, and Chum salmon, as well as Steelhead, Dolly Varden, and Cutthroat Trout.

Under the federal Endangered Species Act (ESA), Chinook Salmon and Bull Trout have been listed as threatened species, and Coho Salmon are a candidate for listing. Salmon runs throughout the Puget Sound and the Northwest are critically depressed. All local governments that border the Puget Sound or that contains streams flowing to the Sound are affected by federal fisheries management. To help restore healthy salmon runs, local governments and the State government must work proactively to address salmon habitat protection and restoration. Issues of storm water run-off, and associated

Raccoon Tracks Along Milwaukee Creek

erosion, sedimentation, and pollution, are affected by the ESA.

The Washington Department of Fish and Wildlife (WDFW) has developed the Priority Habitats and Species (PHS) program to help guide growth in a manner that will preserve the best and most important habitats and provide for the life requirements of fish and wildlife. Priority species are fish and wildlife species that require protective measures and/or management guidelines to ensure their perpetuation. Priority habitats are habitat types with unique or significant value to many species. The WDFW has documented the locations of priority habitats and species within the City. These PHS areas include wetlands, natural open space, habitat for a priority bird species, and the point location of priority bird species sightings. PHS areas are considered critical wildlife habitats.

Trout Lake and its associated wetlands are bounded by an established single-family residential neighborhood. As well as being primary habitat for the typical community of urban lake wildlife, it is annually stocked with fisheries game fish, and it supports populations of native game fish such as bass, perch, and catfish.

The somewhat less significant wetlands throughout the planning area that are isolated from the waters of the river and lake systems typically support a subsection of these populations by providing crucial habitat for breeding, maturing, watering and feeding, and migrating.

3.6 Air Quality

Air quality is measured by the concentration of chemical compounds and particulate matter in the air outside of buildings. Air that contains carbon monoxide, ozone, and particulate matter can degrade the health of humans, animals, and plants. Human health risks from poor air quality range in severity from headaches and dizziness to cancer, respiratory disease, and other serious illnesses, to premature death. Potential ecological impacts include damage to trees and other types of vegetation. Quality of life concerns include degradation of visibility and deposit of soot and other particulate matter on homes and other property.

3.7 Critical Areas

The Growth Management Act (GMA) requires that critical areas be designated and that each jurisdiction adopt development regulations to protect these areas.

3.7.1 Geologically Hazardous Areas

Generally, these areas can be considered to be areas in which there is a possibility that a certain type of potentially destructive geologic activity will take place. Human activity influences, and sometimes accelerates these processes. Development on or adjacent to severe slopes with high erosion hazard may have a negative impact on slope stability.

Landslide - West Valley Highway South

Erosion Hazard Areas: Erosion hazard areas are identified by the Soil

Conservation Service as having "severe rill or inter-rill erosion hazard."

Erosion is a natural process where rain, running water, and wind loosen and transport soil from one location to another. Of these natural forces, erosion by rain and running water is by far the most common within the Puget Sound region. The susceptibility of any soil type to erosion depends upon the physical and chemical characteristics of the soil, its protective vegetative cover, slope length and gradient, the intensity of rainfall, and the velocity of water runoff. The City contains areas that are prone to erosion activity. Steep slope areas and areas cleared of vegetation are the most susceptible.

Landslide Hazard Areas: Landslide hazard areas are those which are potentially subject to landslides because of a combination of geologic, topographic, and hydrologic factors.

Seismic Hazard Areas: Seismic hazard areas are those which are subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement, and soil liquefaction. These conditions occur in areas underlain by soils with low cohesion and density, usually in association with a shallow groundwater table. When shaken by an earthquake, certain soils lose their ability to support a load. Some soils will actually flow like a fluid; this process is called liquefaction. Loss of soil strength can also result in failure of the ground surface and damage to structures supported in or on the soil. Loose, water-saturated materials are the most susceptible to ground failure due to earthquakes. The primary areas of seismic hazards within the City of Pacific are those along steep slopes, within valley bottoms, atop alluvial fans, and some areas of filled/graded land.

Nisqually Quake Damage

Seismic events in the Puget trough are generally the result of a sudden shift of rock mass within the earth's surface as the Juan de Fuca plate moves downward along the North American plate. The three most recent destructive earthquakes in the region were in 1949, 1965, and 2001. The 1949 quake was centered near Olympia and registered 7.1 on the Richter scale. The 1965 quake was centered near Seattle and registered 6.5. The 2001 Nisqually quake was centered northeast of Olympia, and registered 6.8.

Minor and major seismic events are considered inevitable throughout the Puget Sound basin. The timing and epicenter of such events cannot be predicted. However, the record of past events, the presence of river bottom soils subject to liquefaction and amplification, and the presence of glacial till soils in steep slope areas that are subject to landslides, indicate significant seismic hazard.

Volcanic Hazard Areas: Volcanic hazard areas are those subject to pyroclastic (ash fall) flows, lava flows, mud flows (lahars), or related flooding resulting from volcanic activity. The most current USGS ~~v~~ Volcanic ~~h~~ Hazards map (Map 3.4) indicates the Pacific area is at a Case 2 Inundation Level (Debris Flow and Debris Avalanche Zone) - 100 to 500 year frequency, and at somewhat greater risk of flooding resulting from such an event. Pacific has one of the highest percentages of population and assets in the Mt. Rainier lahar zone (USGS – Community Exposure to Lahar Hazards from Mt. Rainier, Washington –

Scientific Investigations Report 2009-5211). Since the prevailing winds tend to blow eastward, ~~the area~~ Pacific is at minimal risk from pyroclastic events.

Steep Slopes: Most of the Pacific planning area is river valley bottomland and is relatively flat. However, the terrain rises from 50' elevation above sea level on the valley floor to over 300' on the city's western plateau. The City of Pacific has defined critical slopes as those 30% or greater averaged over distance per King County's Critical Areas Ordinance. The slopes of these valley walls by these criteria are generally greater than 30% and are shown on the Critical Areas Map at the end of this chapter.

July 1980 Mt. St. Helens Eruption from S. 277th St.

Because of the adverse effect on local runoff and drainage profiles, development should not be located in areas with 8% or steeper grades without erosion control and geotechnical studies to assure mitigation. Development on these slopes would result in increased runoff volumes and rates, would tend to cause erosion, would divert runoff to unsuitable locations, and could drastically alter the area's aquifer recharge processes. These slopes should also generally be considered to be at some risk of landslide during seismic or volcanic events.

Because of its valley bottom location, the major hazards in Pacific are from earthquakes and excessive flooding. During a major earthquake, the unconsolidated alluvial soils of the river valley may liquefy, causing extensive structural damage. These water-saturated soils amplify the shock waves from an earthquake and tend to lose their structural strength.

Aquifer Recharge Areas: These occur where the prevailing geologic conditions allow infiltration rates which create a high potential for contamination of groundwater resources or contribute significantly to the replenishment of ground water.

Flood Hazard Areas: Flood Hazard Areas are lands within a floodplain which are subject to a one percent or greater chance of flooding in any given year. The floodplain consists of two components, the floodway and the flood fringe.

The floodway is that portion of the floodplain which is subject to inundation by deep and fast moving waters. Development within the floodway is prohibited since these waters have the potential to displace structures. The flood fringe is that portion of the floodplain outside the floodway which is subject to inundation by relatively slow moving waters, generally known as the base flood or 100-year flood (one percent chance per year).

The flood fringe includes land areas reserved for conveyance and discharge of the base flood without cumulatively increasing the water surface elevation by more than one foot and which may provide needed temporary storage capacity for flood waters. The White/Stuck River flood fringe is Pacific's principle aquifer recharge area. Where legally feasible, the avoidance of construction in the flood fringe should be considered.

The basis for establishing the areas of special hazard is a 1980 report by the Federal Insurance Administration entitled "The Flood Insurance Study for the City of Pacific" and accompanying Flood Insurance Rate Maps (FIRM), which are periodically updated (Map 3.5). This map is subject to revision due to the rising riverbed of the White River.

Mud Mountain Dam is an earth- and rock-fill dam on the White River six miles southeast of Enumclaw. It was built in 1949 and modified in 1990 to provide flood control for the White and Lower Puyallup River Valleys. The two towers at the dam were replaced in 1994 by a single tower designed to withstand severe earthquakes. The Howard A. Hanson Dam, built on the Green River in 1961, also helps control flooding in the area.

Flood Hazard Area - White River Estates

The King and Pierce County River Improvement agencies own much of the property within the White/Stuck River floodplain and maintain the levee system along the river through the planning area. King County is now is the process to relocate the levees on the left bank of the White River in Pacific to create additional flood storage capacity. Existing levees will be removed and relocated further east of their present location. The purpose of the relocation is to allow the river channel to migrate more naturally, create flood storage capacity and to help alleviate potential flooding of structures on the right bank of the White River. This would be beneficial to the White River Estates Subdivision which was flooded in January of 2009. In the near future, the county will be relocating the levees on the right bank of the White River which will also increase flood storage capacity. The City has adopted FEMA flood regulations to further control and averts ~~most severe~~ flooding activity.

Wetlands: Wetlands are defined by the U.S. Army Corps of Engineers as areas "that under normal circumstances have hydrophytic vegetation, hydric soils, and have periodic or permanent inundation or prolonged soil saturation sufficient to create anaerobic conditions in the soils (wetland hydrology)."

The Growth Management Act defines wetlands as "…areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created for non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities. However, wetlands may include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands, if permitted by the county or city."

The GMA requires that wetlands regulated under the GMA be delineated in accordance with the Revised Code of Washington (RCW) 90.58.380. RCW 90.58.380 requires that the State "shall adopt a manual for the delineation of wetlands under this chapter that implements and is consistent with the 1987 manual in

use on January 1, 1995, by the United States army corps of engineers and the United State environmental protection agency". The State adopted a 1997 manual that was in accordance with the original 1987 Corps of Engineers (COE) manual. This was incorporated under Washington Administrative Code (WAC) 173-22-080. During the past few years the COE has updated and expanded their delineation manual. To ensure consistency between the State manual and COE manual WAC 173-22-080 was repealed and WAC 197-22-035 revised to state that delineations should be done according to the currently approved federal manual and supplements. ~~requires jurisdictions to use the 1997 Washington State Wetlands Identification and Delineation Manual to delineate wetlands for regulatory purposes~~. The Washington State Wetlands Rating System (as modified in 2014) is used to evaluate the wetlands.

Wetland - White River Floodplain

~~The U.S. Fish and Wildlife Service have produced a series of maps (National Wetlands Inventory), which delineate wetland areas and these are shown on the Wetlands Map at the back of this chapter.~~ The City's "wetlands mapping" was revised in the spring of 2015. The mapping was based upon a number of data sources and is reflected in Map 8.5 at the end of this chapter. These sources, in part, included the following:

- US Fish and Wildlife Service National Wetlands Inventory Maps (NWI).
- Updated online soils maps
- Washington State Department of Fish & Wildlife maps
- Google aerial photo's
- Wetland Delineation Report West Valley Highway (2014)
- Washington Department of Transportation Biology and Environmental Staff Urban Corridors Office – Ecosystem Technical Report SR 167-8TH Street East Vicinity to 277th Street SW Vicinity Southbound HOT Lane (2008)
- Washington Department of Transportation Biology and Environmental Staff Urban Corridors Office – Ecosystem Technical Report SR 167-8TH Street East Vicinity to 15th Street SW Vicinity Northbound HOT Lane (2009)
- Approximately 31 wetland reports supplied as part of development proposals
- Field visits by a "qualified" wetlands biologist to field verify wetland delineations of wetland reports more than five (5) years old.

It is important to note that the map provides a generalized inventory of wetlands within the planning area and in most cases points to the need for further wetlands delineation studies prior to development. It does not imply that any particular parcel covered by a wetland designation is completely occupied by wetlands or is totally constrained from development.

The size and extent of wetlands constantly change under natural climatic and artificial influences, and determinations relative to specific sites must be made individually. In general, wetlands are environmentally sensitive areas and present limitations to construction and other activities such as siting

of facilities. Depending on the site and nature of the activity, permits and/or mitigating measures are often required if development is allowed at all.

~~Some of the wetlands within the City of Pacific have been identified and delineated on the King and Pierce County Comprehensive Drainage Program Maps. In September of 1997, the City conducted additional generalized mapping of potential wetlands to aid in development review. However, other wetlands have not been identified and will be identified during required site specific studies as part of the development review process.~~

3.8 Lower White River Biodiversity Management Area (BMA)

Pacific is located in the Lower White River Biodiversity Management Area. A Stewardship Plan was created for this area through the cooperation of many local, state, federal, educational and nonprofit organizations. The Lower White River Biodiversity Management Area (BMA) extends from Buckley to Sumner. The Management area is one (1) of 16 BMA's indentified in Pierce County. The Pierce County Biodiversity Alliance (PCBA) has been actively involved in the biodiversity planning efforts at the local level since 1997. The Stewardship Plan for the Lower White River Biodiversity Management Area provides a nonregulatary planning tool for biodiversity planning. As stated in the plan, the benefits of biodiversity planning include:

- Protects remaining high-quality land cover important for fish and wildlife
- Implements Growth Management Act requirements for Habitat Conservation Areas
- Provides regional connectivity network for fish and wildlife dispersal and migration
- Establishes proactive approach to help avoid future listings under ESA
- Includes all habitat types not just point specific habitats such as wetlands, streams, endangered species locations

As part of the Stewardship Plan, the PCBA conducted a "biobiltz" identifying birds, mammals, amphibians, reptiles, fish, invertebrates, and plants within the Lower White River Management Area (2006 & 2007). The bioblitz in Pacific revealed a diverse number of plants, animals and birds including bald eagles and green herons.

Bald Eagle

Conservation of biodiversity is necessary if benefits including important ecosystem services such as clean water, natural flood control, timber production, climate regulation, and pollination currently enjoyed and relied upon by residents of the City are to be available for future generations. Protection of biodiversity in all its forms and across all landscapes is critical to continued prosperity and quality of life in the City. In fisheries, forestry, and agriculture, the value of biodiversity to sustaining long-term productivity has been demonstrated in region after region. With the impending effects of climate change, maintaining biodiversity will be critical to the resilience of resource-based activities and to many social and ecological systems. The continued increase in the City's population and the projected effects of climate change make conservation a difficult but urgent task. The protection and restoration of biodiversity and of a full range of supporting habitats is important.

4. FUTURE NEEDS AND ALTERNATIVES

4.1 Vegetation, Fish, and Wildlife

4.1.1 Vegetation

Environmentally based development standards and incentives help protect native vegetation during the development process. For example, these standards could include a requirement that the developer file a vegetation management plan that specifies how vegetation removal will be minimized and where replacement trees will be planted. Incentives should include density bonuses or expedited permit review for housing that protects areas of undisturbed open space, especially when significant vegetation is preserved.

Other tools which can be used to protect vegetation include public education, habitat enhancement assistance, conservation easements, open space designation and property tax reductions, transfer or purchase of development rights, and outright acquisition. The goals and policies contained in this Plan will be used to develop specific regulations, incentives, and programs, to be identified in the Municipal Code.

4.1.2 Fish and Wildlife

Washington Department of Fish and Wildlife (WDFW) management recommendations are intended to assist landowners, users, and managers in conducting land-use activities in a manner that incorporates the needs of fish and wildlife. Management recommendations are developed through a comprehensive review and synthesis of the best scientific information available. The City may review the PHS management recommendations developed by WDFW and adapt these to fit the existing conditions and limitations of our unique environmental conditions. Management guidelines for priority habitats and species may be established in the Pacific Municipal Code.

Additional priority habitats and species may occur in areas not currently known to WDFW biologists or in areas for which comprehensive surveys have not been conducted. PHS data can only confirm that a species or habitat type may be present. This data does not confirm that a species or habitat type is not present. Site-specific surveys may be necessary to rule out the presence of priority species and priority habitats on an individual project site. WDFW has established guidelines, which enable local governments to designate and protect species of local importance. The City will work with WDFW, residents, and other interested parties to identify and protect native wildlife species and habitats from the adverse impacts of current land use and future development.

4.2 Air Quality

One of the basic characteristics of a livable city is clean air. Numerous federal, state, regional, and local agencies enact and enforce legislation to protect air quality. Good air quality in Pacific, and in the region, requires controlling emissions from all sources, including: internal combustion engines; industrial operations; indoor and outdoor burning; and wind-borne particles from land clearing and development. In the Puget Sound region, vehicle emissions are the primary source of air pollution. Local and regional components must be integrated in a comprehensive strategy designed to improve air quality through transportation system improvements, vehicle emissions reductions, and demand management strategies.

4.3 Critical Areas

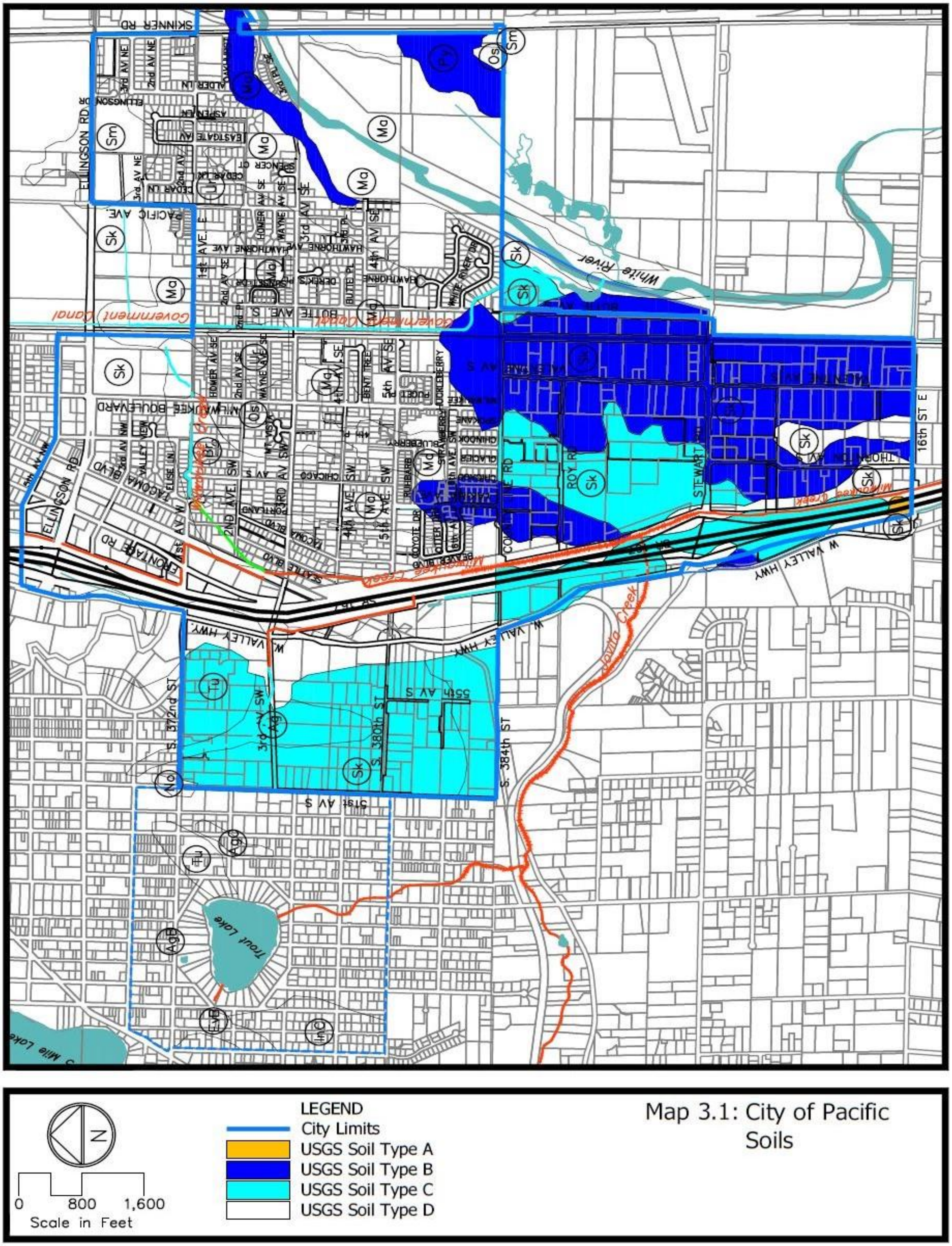
Over 90% of the original critical areas in the City of Pacific have been destroyed in over 90 years of urban development. As suggested in the Draft - Model Critical Areas Regulations and Review Procedures by the Office of Community Development, innovative mitigation techniques should be encouraged, such as the creation or enhancement of a larger system of critical areas and open space in preference to the preservation of many individual habitat areas.
See the Parks, Open Space, Recreation, and Trails element for more detailed policies and discussion of critical areas protection and enhancement.

4.3.1 Wetlands

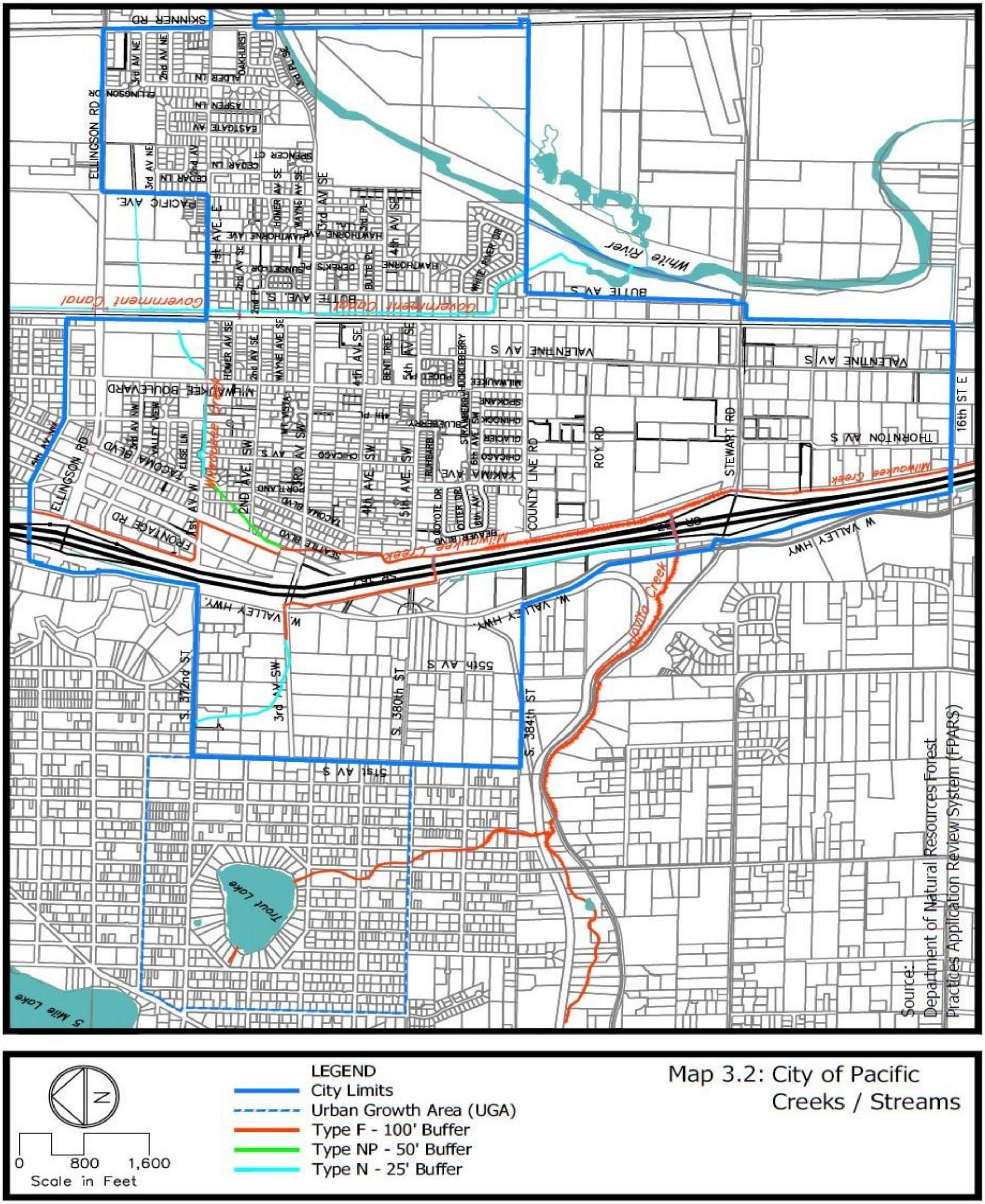
When planning the future of the community, it is important to consider the specialized functions that wetlands perform as part of the natural ecosystem.

Wetlands receive surface water from surrounding areas and filter pollutants by a combination of physical, chemical, and biological processes. Wetlands also play a significant role in flood control. During flooding, streams overflow their banks and spread out across the floodplain. Wetlands attenuate the peak flows from storm events by storing water during wet periods and discharging the stored water during drier periods.

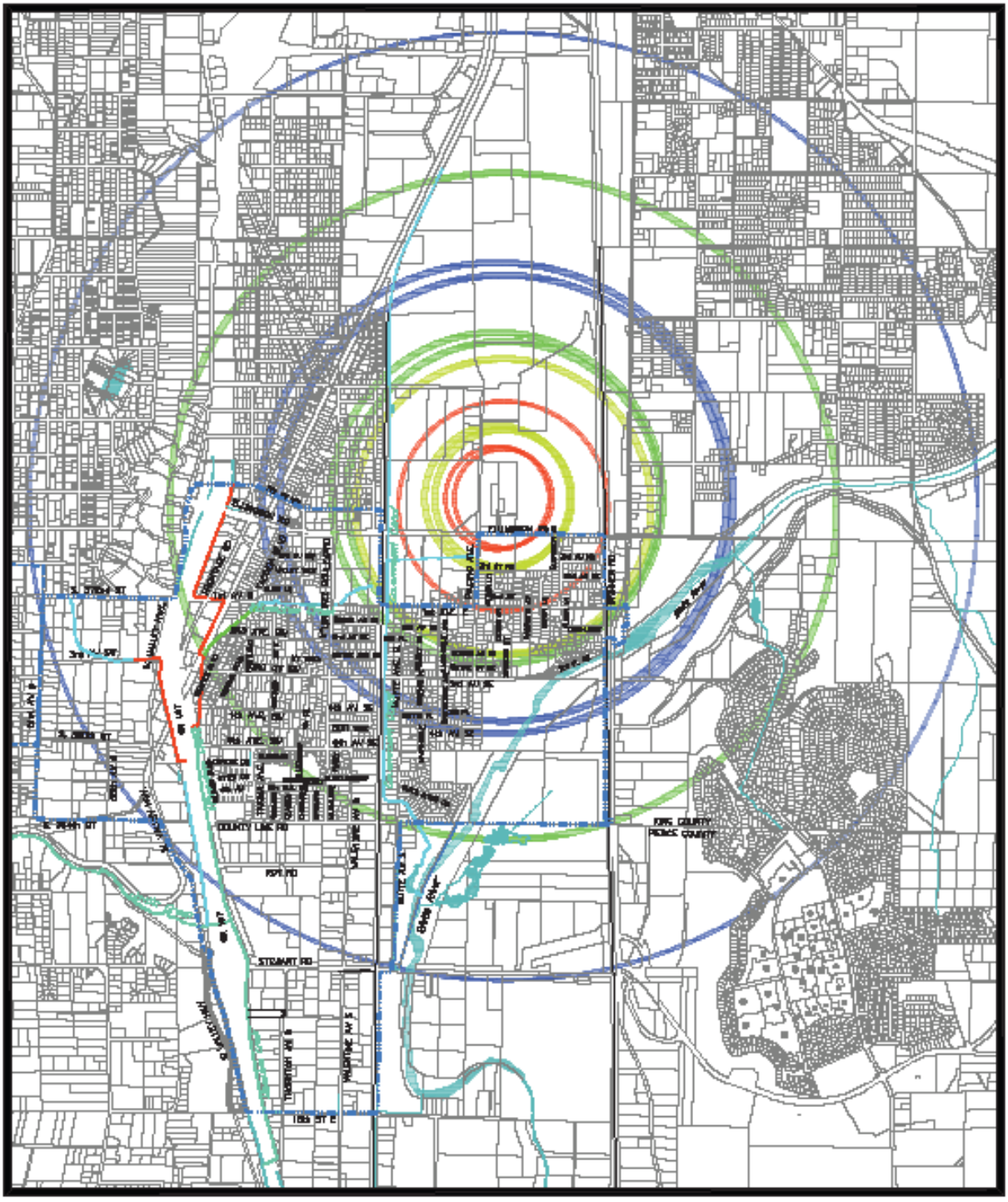
To maintain water quality, support groundwater, vegetation, and wildlife, it is imperative that wetlands be preserved. Clearing of vegetation, grading, filling and draining, and other activities associated with land development, may decrease the ability of the zone to provide drainage, stabilize stream banks, provide wildlife habitat, and filter pollutants from the water.

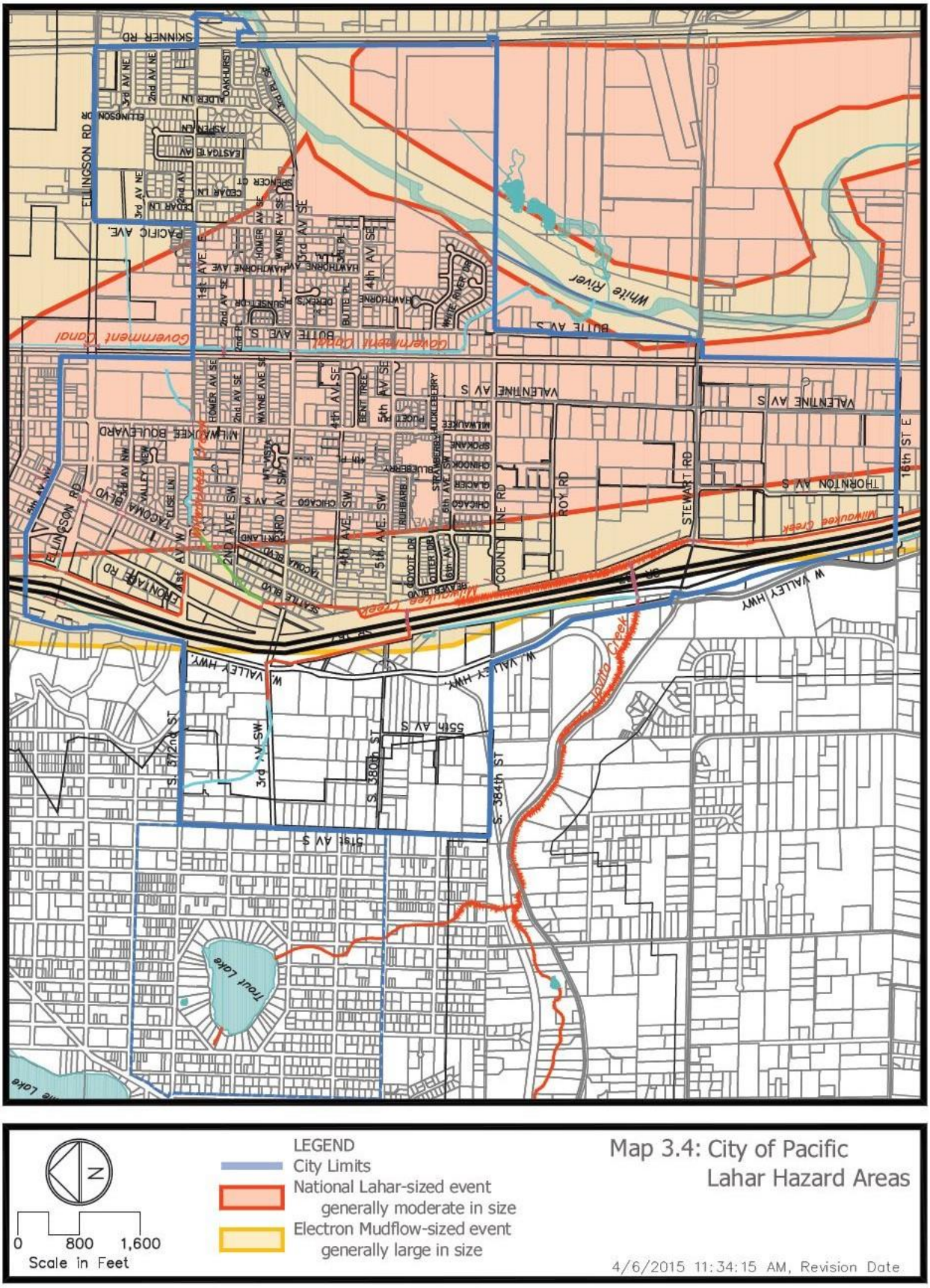


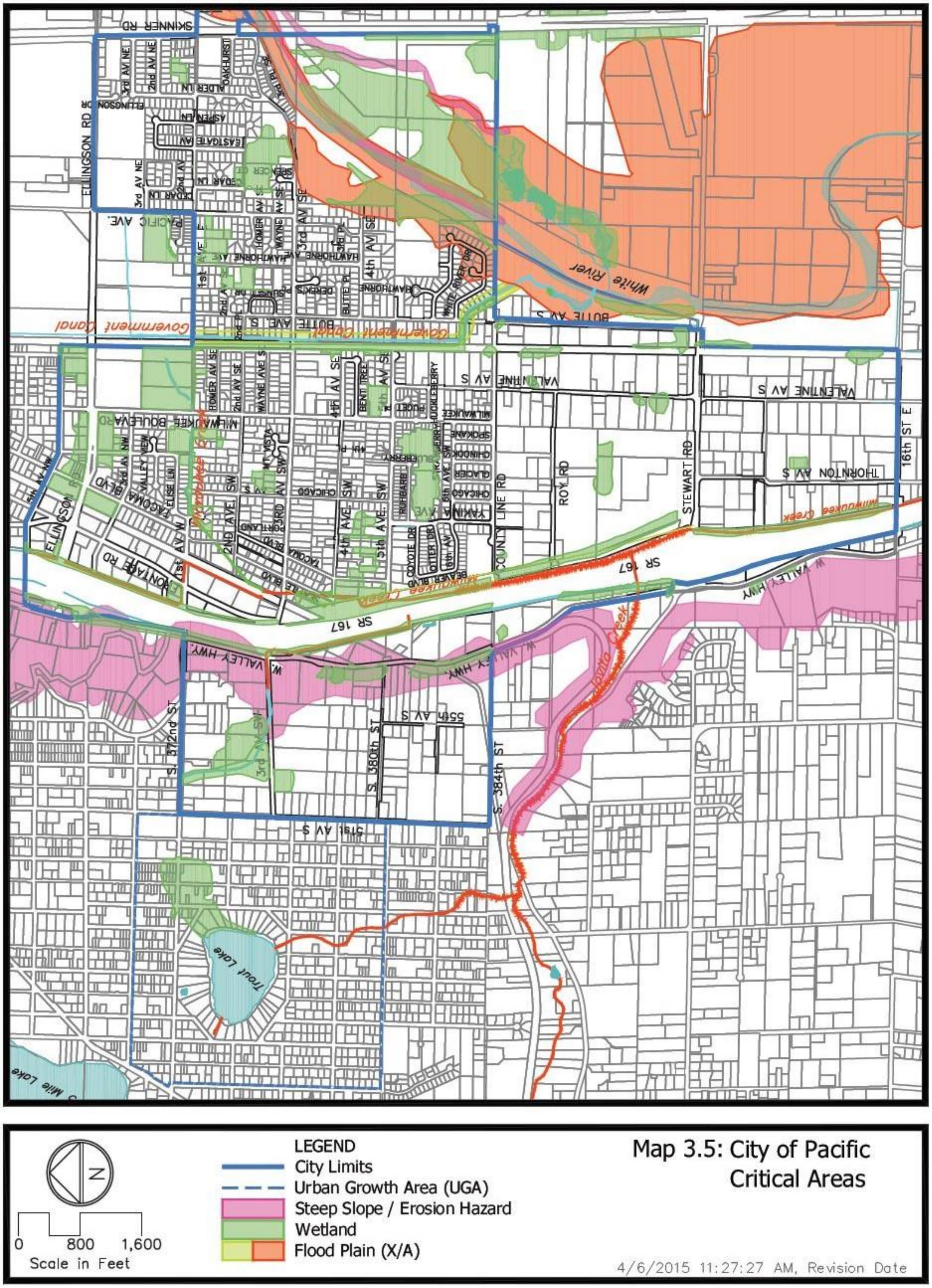
Map 3.1: City of Pacific Soils



Map 3.2: City of Pacific
Creeks / Streams


LEGEND
City Limits
Urban Growth Area (UGA)
6-Month Travel Zone
1-Year Travel Zone
5-Year Travel Zone
10-Year Travel Zone
N
0 1,500 3,000
Scale In Feet
Map 3.3: City of Pacific Wellhead Protection Area


LEGEND
City Limits
National Lahar-sized event
generally moderate in size
Electron Mudflow-sized event
generally large in size
N
0
800
1,600
Scale in Feet
Map 3.4: City of Pacific
Lahar Hazard Areas
4/6/2015 11:34:15 AM, Revision Date



Map 3.5: City of Pacific Critical Areas

CHAPTER 8

TRANSPORTATION

1. INTRODUCTION

1.1 Framework Goal

The framework goal of the Transportation Element of the Comprehensive Plan is to:

> *Provide an efficient and safe multi-modal transportation network for residents, employees, businesses, and visitors while maintaining a small town quality of life.*

The Transportation element specifically considers the operations and condition of the existing transportation network; the cause, scope, and nature of transportation problems based on the adopted Land Use Plan; projected transportation needs; and a funding an implementation plan to ensure that the City's adopted level of service (LOS) is maintained.

This element contains updates and revisions to the 1995 Comprehensive Plan and a subsequent Amendments. ~~Amendments were also made in 2001.~~ Those included policies urging county and regional transit agencies to provide better service to Pacific residents and link Pacific to the nearby multi-modal transit stations. ~~A new Transportation Facilities map was also added in 2001.~~

The City of Pacific is located in King County and Pierce County, therefore its Transportation element has been developed in accordance with both King and Pierce County Countywide Planning Policies. It has been integrated with all other planning elements to ensure consistency throughout the Comprehensive Plan.

The Transportation element has also been developed in accordance with Section 36.70A.070 of the Growth Management Act (GMA), to address the motorized and non-motorized transportation needs of the City of Pacific. It represents the community's policy plan for the next 20 years.

Growth Management Act Requirements

The Growth Management Act (GMA) provides a framework for addressing land/use transportation linkages and a mechanism for assessing the impacts of planned growth. Although the GMA has very specific requirements, flexibility is written into the law so that each city can tailor its plan to its unique long range community vision and goals. The GMA requires development of a transportation element within the City's Comprehensive Plan that contains these basic components :

~~Basic components of this element are:~~

- Inventory of transportation facilities and services, including roadways, transit, ferries, non-motorized and freight;
- Existing conditions of roadway links
- Future Conditions and needs assessment for ~~2010~~2025
- Future Conditions and needs assessment for ~~2025~~2035
- Goals and Policies
- ~~House Bill 1487~~RCW 47.06.140 Compliance

- Funding strategies for concurrency

Concurrency

This element contains the City of Pacific's plan to provide specified levels of transportation service in a timely manner. The Level of Service (LOS) standards that are adopted in this plan will be maintained through upkeep of the existing circulation system and expansion of transportation services where needed.

The City has adopted a roadway link and intersection Level of Service standard of D. As specified by the GMA, new developments will be prohibited unless transportation improvements or strategies to accommodate the impacts of development are in compliance with concurrency. Improvements will be in place at time of development, or financially planned for within six years of development use. Concurrency will be applied in accordance with State statutes and the resources available to the City of Pacific.

Major Transportation Considerations and Goals

Because transportation and land use are inter-related, and each has the ability to have a profound impact on the other, it is important to consider type and availability of transportation resources in the development of land use patterns. The City's Comprehensive Plan reflects this mutual dependency and need for coordination.

The City's Vision for coordinated land use and transportation system includes:

- Environmental stewardship of critical areas, including conservation of land, air, water, and energy resources.
- ~~Encourage p~~Planning practices that promote livability, pedestrian and non-motorized transportation, and reduces air and noise pollution and traffic congestion.
- ~~Encourage c~~Citizen participation in planning the future of the community.
- Support the local economy by providing a predictable development atmosphere, encouraging diversity in the range of goods and services, and ensuring that employment opportunities are balanced with a range of housing and commercial opportunities.
- Increase opportunities for enjoyment of recreational and cultural activities, providing a range of activities for all ages and users.

2. GOALS AND POLICIES

The following transportation goals and policies are considered essential for meeting the quality of life as outlined in the City's long range Vision Statement. The policies specify what should be accomplished to reach the goals. These policies are intended to provide clear guidance for decision making. Accomplishments under these policies can be used to measure progress toward the goals.

REGULATORY CONSIDERATIONS

GOAL T1: Provide an efficient and safe multimodal transportation system to improve mobility for residents, employees, and visitors of Pacific while maintaining the small town quality of life and supporting the economic vitality of the City.

POLICIES

Policy T1.1:
The City will plan for a safe, convenient and efficient transportation network for all residents and visitors of Pacific. This system should be compatible with neighboring cities, King and Pierce counties, Washington State, and other transportation providers.

Discussion: Private vehicles are the most common mode of travel throughout the region. It is anticipated that the majority of vehicle trips within Pacific will continue to be private vehicles. It is necessary that this system be coordinate with neighboring communities, the counties and state to provide a consistent blended transportation network.

Policy T1.2:
Work with other jurisdictions to plan, fund, and implement multi-jurisdictional projects necessary to meet shared transportation needs (including right-of-way preservation and purchase).

Discussion: State Highways and arterials are part of the regional ~~transporation~~transportation network. They not only impact the citizens of Pacific, but the stakeholders of adjacent jurisdictions and the region. Coordination of planning and funding with other agencies is essential to complete projects cost-effectively.

Policy T1.3:
Pacific will adopt a level of service (LOS) of "D" for all streets.

The term "below the level of service standard" shall apply to situations where traffic attributed to a development results in either of the following:

a. An unacceptable increase in hazard or safety on a roadway.
b. An increase in congestion which constitutes an unacceptable adverse environmental impact under the State Environmental Policy Act.

Discussion: It is not practical or economically feasible to eliminate all transportation delays. Therefore, a LOS of 'D' has been established for all streets. New development projects will be required to perform a traffic impact analysis (TIA) to determine if there will be an ~~adversa~~adverse impact on the current level of service.

Policy T1.4:
The City street system is made up of three functional classes:

a. *Arterials - a system of City, state, and county streets designed to move traffic from or to one area within the local area to or from another area. These streets should be adequate in number, appropriately situated, and designed to accommodate moderate to high traffic volumes with a minimum of disruption in the flow.*

b. *Collector Streets - a system of the intra-county or City roads linking residential neighborhoods to the urban street system.*

c. *Local Streets - a system of City streets which collect traffic from individual sites and carry the traffic to the arterial system.*

Discussion: Street classifications are determined at the regional and local level. The regional classifications determine the availability of potential project funding on those roadways. The local classification identifies local limitations on roadway usage to reduce "wear and tear".

Policy T1.5: *Limit and provide access to the street network in a manner consistent with the function and purpose of each roadway classification.*

Discussion: The City will seek consolidation of access points to state highways, arterials, and major collectors. This will complement the highway and arterial system, reduce interference with traffic flows on arterials, and discourage through traffic on local streets.

To achieve this level of access control, the City:

- Supports the State's controlled access policy on all state highway facilities;
- May acquire access rights along some arterials and major collectors;
- Encourages and may require landowners to work together to prepare comprehensive access plans that emphasizes internal circulation and discourage multiple access points to major roadways;
- Encourages consolidation of access in developing commercial and high density residential areas through shared use of driveways and local access streets.

Policy T1.6:
Require dedication of roadway rights-of-way for new development consistent with the appropriate functional classification, adopted road standards, and the Comprehensive Plan.

Discussion: New development will result in additional traffic on City streets. Private development will be required to prepare a traffic impact analysis to determine the impact on the current level of service. Projects impacting the level of service will be required to mitigate those impacts.

Policy T1.7: *Design new residential streets to discourage cut-through traffic while maintaining the connectivity of the transportation system.*

Discussion: Residential streets often have increased number of pedestrians. Measures to reduce speed and to limit cut-through traffic to increase safety will be implemented in compliance with the Manual of Uniform Traffic Control Devices (MUTCD) as determined during the planning phase of the project.

Policy T1.8:
The City adopts the following policies on driveway access:

- *Driveway accesses onto designated arterials and collectors shall be minimized.*
- *Wherever a development fronts on two or more streets, access shall be limited to the lowest-designated street.*
- *No subdivision of land shall be permitted which creates a new lot fronting on an arterial or collector street without establishment of cross easements for access and egress, and*
- *No such subdivision shall increase the total number of access points onto Pacific's arterial or collector streets.*

Discussion: Arterial and collector streets frequently have a higher volume of traffic and occasionally increased speeds. Minimizing ingress/egress points on higher volume and higher speed roadways will maintain a higher level of service and reduce potential accidents.

Policy T1.9:
Efficient movement of existing pass-through traffic should be accomplished through traffic light synchronization, speed reduction, access management, channelization improvements, and multimodal design features; and with a minimum of disruption to the local community.

Discussion: There are two pass-through east-west corridors in Pacific: Ellingson Road and Stewart Road. Ellingson Road connects SR 167 to Pacific, Algona, Auburn, and portion of unincorporated King and Pierce Counties. This corridor currently has seven traffic lights and one railroad crossing under the control of five jurisdictions. Stewart Road currently has five lights, proposed to increase to eight lights, and one railroad crossing under the control of five jurisdictions. The traffic flows westerly in the morning and easterly in the evening. Synchronized signals in these corridors will help to prevent a decrease in the level of service as the development in the rural areas increases.

~~**Citizen Participation**~~

~~**GOAL T2: Develop a citizen participation program (Transportation Advisory Committee) to increase public involvement in transportation planning.**~~

~~**Policy T2.1:** Support and promote public involvement in Pierce Transit, King County Metro, and Regional Transit Authority decision-making.~~ (Policy moved under Transit)

PEDESTRIAN MOBILITY

GOAL T~~3~~2: Ensure adequate accommodation of pedestrian needs in all transportation policies and facilities.

POLICIES

Policy T~~3~~2.1:
Sidewalks, trails, and other walking facilities should be extended throughout the City to allow more convenient and efficient pedestrian movement.

Discussion: The City is committed to providing alternative methods of transportation for pedestrians. Priority should be given to sidewalks leading to schools.

Policy T~~3~~2.2:
Where appropriate, the City will install new sidewalks in pedestrian corridors considered by the City to be high priority [i.e., parks and areas used by elderly or handicapped persons] within two years of ***identification, as funds allow.***

Discussion: A planned and prioritized pedestrian network provides direction to staff when seeking funds for new projects. End use generators must be identified. Coordination with school transportation is also important to provide safe facilities for students.

Policy T~~3~~2.3:
Whenever the City contemplates reconstruction or major maintenance (including resurfacing) work on a City street that is without sidewalks, it should fully explore the possibility of adding sidewalks at the time of the street improvement.

Discussion: State and Federal funding programs require evaluation of pedestrian needs for most roadway improvement projects. Most programs require that existing pedestrian facilities be reviewed and evaluated for conformance with current accessibility requirements.

Policy T~~3~~2.4
Pedestrian access to the transit system in all land use areas, including residential, commercial and industrial, should be ensured by providing convenient and attractive walkways to transit stops. Fences, walls, and development patterns that inhibit pedestrian access to transit stops are discouraged.

Discussion: The current transit system is very limited. However, transit systems expand and contract with available funding. All arterials should provide sidewalks. Bicycle facilities should be evaluated based on alternative corridors and the proposed vehicle allocation. Pedestrian route of travel shall be evaluated for each new project to assure safe ingress/egress.

Policy T~~3~~2.5:
The City ~~shall~~ should encourage consideration of the needs of pedestrians in all public and private development.

Discussion: Development should be evaluated to determine the level of pedestrians potentially generated by a project and the likely route of travel. The project may be required to provide adequate facilities to provide a safe course of travel.

Policy T~~3~~2.6: The City should ensure safe and comfortable pedestrian connectivity to transit stops in major employment areas.

Discussion: *Safe and comfortable pedestrian connectivity helps to encourage increased transit use. The provision of sidewalks with planter strips between the curb and sidewalk provides a greater separation of pedestrian and vehicular traffic. This in turn provides a heightened sense of safety for pedestrians.*

~~**Level of Service (LOS)**~~

~~**GOAL T4:** The transportation network shall meet the City's adopted LOS D upon approval of development, or as identified for improvement within 6 years.~~

~~**The term "below the level of service standard" shall apply to situations where traffic attributed to a development results in either of the following:**~~

~~**a. An unacceptable increase in hazard or safety on a roadway.**~~
~~**b. An increase in congestion which constitutes an unacceptable adverse environmental impact under the State Environmental Policy Act.**~~

FREIGHT MOBILITY

GOAL ~~T5~~3: Develop a transportation system that enhances the delivery and transport of goods and services. Improve existing, and construct new facilities for freight movement within the Sumner-Pacific MIC.

POLICIES

Policy ~~T5~~3.1:
Facilitate the movement of freight and goods through Pacific with minimal adverse traffic and environmental impact.

Discussion: The City should ~~by~~ develop~~ing~~ viable, established truck routes connecting to highway systems, thereby minimizing the impacts to established residential and commercial areas. These routes should be ~~D~~designed to provide sidewalks and roadways to serve the needs of freight while minimizing potential conflicts between trucks and pedestrians.

Policy ~~T5~~T3.2:
Enforce regulations so that, outside of designated routes, trucks do not utilize City streets, except for local deliveries and services.

Discussion: Roadway designs are based on vehicle capacity, anticipated weight load, trip generators, etc. Each road is designed to be cost effective. A road that is anticipated to accommodate large vehicles is designed ~~ott~~o a higher standard than a road used primarily for passenger vehicles. Therefore, to preserve the transportation system, some roads permit truck traffic and others do not.

Policy ~~T5~~T3.3:
Projects which enhance freight and goods movements which benefit largely State, Federal, or national needs should be constructed to minimize the impact on the City's local transportation system. The primary beneficiaries of such projects, not the City of Pacific, should fund these projects and their mitigation.

Discussion: Development that will generate large vehicle traffic will need to provide a clear route for ingress / egress of the vehicles to their respective development without utilizing elements of the road system not intended for their use.

Policy ~~T5~~T3.4:
The City shall continue to work with the Freight Mobility Roundtable, Fast, and other regional groups to address regional needs mitigate local impacts, and support freight mobility in the Sumner-Pacific MIC and other designated areas.

Discussion: Importing and exporting is a large portion of the State's economy. This requires warehousing of goods for redistribution throughout the country. Freight mobility is a critical element for Washington ports to compete with other west coast ports.

Policy ~~T5~~T3.5:
Identify and address areas within the Sumner-Pacific MIC (Manufacturing Industrial Center) where efficient truck access and circulation are hindered by infrastructure gaps and inadequate design. Ensure future transportation improvements address the needs of large trucks, including intersection turning radii, driveway design and street weight load capacity.

Discussion: The Cities of Pacific and Sumner are working in a cooperative effort to reduce obstacles to freight mobility in the Sumner Pacific MIC (Manufacturing Industrial Center). This includes the current work on Stewart Road and Valentine Avenue. The final hurdle is the White River Bridge and the final segment of Stewart Road to the bridge. These projects are in the planning phase at this time.

Policy ~~T5~~T3.6: Promote public-private partnerships to address the need for improved parking, staging and related services for large trucks in or adjacent to the MIC.

Discussion: Private business may have a better understanding of the need regarding the staging of large trucks within the MIC. This is often due to the economic consideration business need to consider in staging areas and services for large trucks.

PARKING –LAND USE

GOAL ~~T6~~T4: Develop guidelines that ensure adequate parking supply.

POLICIES

Policy T4.1
Ensure the new development provides adequate off-street parking for its operations.

Discussion: Sufficient off-street automobile parking reduces transportation conflicts on streets and supports pedestrian and bicycle uses. The City should require parking to be designed for average need, not full capacity.

Policy ~~T6~~T4.2:
Develop off-street parking that is compatible with abutting uses and supports a pedestrian- oriented streetscape.

Discussion: Pedestrian circulation throughout parking lots should be given careful consideration to minimize impacts between pedestrian traffic and vehicular traffic in parking lots.

Policy ~~T6~~T4.~~2~~3:
New developments shall provide adequate off-street parking to meet their needs.

Discussion: Adequate off-street parking for new developments will mitigate the potential impacts of on-street parking along busy streets. On street parking can result in increased conflicts with vehicular movement on adjacent streets. The current Pacific Municipal Code (PMC) contains formulas for calculating parking requirements. The adopted formulas should be periodically checked to with other municipalities to ensure consistent requirements.

Policy ~~T6~~T4.~~3~~4:
Encourage shared parking, ~~underground parking,~~ or parking structures.

Discussion: Generators of parking demand are often out of phase with each other: businesses operate on an 8 to 5 schedule generate demand during the week and dining establishments and houses of worship often have demand in the evening or on the weekends. If some of these facilities are adjacent to each other, parking can be shared.

ENVIRONMENTAL IMPACTS

GOAL ~~T7~~T5: Minimize the environmental impacts of all new road construction and road improvements.

POLICIES

Policy ~~T7~~T5.1:
The City shall consider the impact of road construction on the environment and natural resources (particularly on sensitive areas, wildlife habitats, and water quality) as part of its environmental review process.

Discussion: Most transportation funding is provided by either State or Federal agencies. A critical element of all projects is an environmental evaluation. Environmental impacts will be reduced to the extent feasible and where it is not feasible, the impacts will be mitigated elsewhere.

Policy ~~T7~~T5.2:
Design transportation facilities within the Pacific Urban Growth Area to minimize adverse environmental impacts resulting from both their construction and operation.

Discussion: Most transportation funding is provided by either State or Federal agencies. A critical element of all projects is an environmental evaluation. Environmental impacts will be mitigated to the extent feasible. In some cases, the use of "low impact development" (LID) techniques should be considered

Policy T~~7~~5.3:
The City of Pacific will:

- *Consider environmental costs of development and operation of the transportation system;*
- *Align and locate transportation facilities away from environmentally sensitive areas:*
- *Mitigate unavoidable environmental impacts wherever possible; and*
- *Solicit and incorporate the concerns and comments of interested parties.*

Discussion: Where possible, transportation facilities should be located around sensitive areas. This provides the benefit of avoiding impacts to sensitive areas and the added costs (mitigation) to construct facilities that may impact sensitive areas.

Policy T~~7~~5.4:
Storm water runoff from roads is a major cause of water quality degradation. All new road construction will employ the best management practices available to promote water quality compliance consistent with the adopted storm water management manuals.

Discussion: The Federal and State requirements for storm drainage require development of new facilities for roadway reconstruction and new roads. Therefore, any new roadway or reconstructed roadway will develop new stormwater facilities meeting State water quality and flow control requirements. Road resurfacing is exempt from this requirement.

AIR QUALITY

GOAL T~~8~~6: The City will coordinate transportation planning with air quality guidelines published by the Puget Sound Regional Council.

POLICIES

Policy T~~8~~6.1:
Support efforts to improve air quality throughout the Pacific area and develop a transportation system compatible with the goals of the Federal and State clean air acts.

Discussion: Most transportation funding is provided by either State or Federal agencies. A critical element of all projects is an environmental evaluation. Environmental impacts will be reduced to the extent feasible and where it is not feasible, the impacts will be mitigated elsewhere. Additionally, air quality receives the greatest impact from idling vehicles. The City has developed a LOS of D to reduce the number of idling vehicles.

Policy T~~8~~6.2:
Coordinate with King County Metro, Pierce Transit, and other jurisdictions on Commute Trip Reduction (CTR) programs for major employers in Pacific and its UGA.

Discussion: New road projects will coordinate with the long term plans of the public transportation agencies, to provide pedestrian and transit facilities as required for future projects.

Policy T~~8~~6.3:
~~Require~~ Consider studies of impacts to air quality generated by traffic from new major developments.

Discussion: Depending on the type of development, traffic impacts are generated at a higher level. In these cases, the impacts to air quality should be considered as part of any environmental review.

Policy T~~8~~6.4:
Promote other Transportation Demand Management (TDM) Programs.

Discussion: New road projects will coordinate with the long term plans of the public transportation agencies, to provide pedestrian and transit facilities as required for future projects.

Policy T~~8~~6.5:
Work with the private and other public sectors to introduce cleaner burning fuels for the existing motorized fleet, and vehicles powered by alternate fuel sources.

Discussion: The City has developed and annually reviews the fleet needs of various departments. A review of budget impacts on alternative fuel vehicles is incorporated into the decision making process.

Policy T~~8~~6.6:
Promote non-motorized transportation modes.

Discussion: The City has developed a series of sidewalks and trails. A long term plan to complete the network should be developed.

TRANSIT

GOAL T~~9~~7: Support improved transit coverage and service throughout the region to improve mobility options for Pacific.

POLICIES

Policy T-~~9~~7.1:
Urge county and regional transit agencies to provide improved service to Pacific residents by providing routes, schedules, and ancillary facilities such as park & ride lots.

Discussion: Public transportation funding is often one of the first budget items to be cut. A valuation of the public transportation benefits needs to be conducted to educate the stakeholders of all costs associated with public transportation funds: reduced congestion; cost per rider mile; parking impacts; etc.

Policy T~~9~~7.2:
Provide for a Park and Ride location in Pacific along SR 167, and identify and evaluate additional locations that could be easily served by public transportation.

Discussion: The ideal location for most park and ride facilities is at or near freeway interchanges. These properties should be noted for possible acquisition. These properties also typically have the highest land values.

Policy T~~9~~7.3:
Encourage King County Metro, Pierce Transit, and Sound Transit to link to each other, and coordinate increased bus service with commuter rail service and local service within Pacific.

Discussion: Private vehicles are the most common mode of travel throughout the region. It is anticipated that the majority of vehicle trips within Pacific will continue to be private vehicles. The City will need to modify the transportation network to meet the needs of increased demand. The provision of transit service to Pacific residents will provide viable options for residents to commute to other destinations. This will help to decrease the demand on the City's road system.

Policy T~~9~~7.4:
Advocate frequent headways and express service, with priority given to higher density residential areas and popular destinations.

Discussion: Providing more commuting options for Pacific residents lessens the impacts to the regional road network and helps to decrease air quality impacts due to fewer vehicular trips on the regions roadways.

Policy T~~9~~7.5:
Support regional express bus service, good connections to commuter rail stops, and a rider-friendly fare system.

Discussion: Providing more commuting options for Pacific residents lessens the impacts to the regional road network and helps to decrease air quality impacts due to fewer vehicular trips on the regions roadways.

Policy T~~9~~7.6:
Consider transit facilities as mitigation for new developments that have probable significant impacts to the transportation system.

Discussion: As the City's Manufacturing Industrial Center (MIC) continues to develop, the provision of transit facilities to encourage commuting to jobs via transit should be considered.

Policy T~~9~~7.~~9~~7:
Promote programs to encourage carpooling, transit, and non-motorized transportation to reduce the transportation impacts of economic and residential development.

Discussion: Updating the City's website will provide links to carpooling and ride sharing programs.

Policy T~~9~~7.~~10~~8:
Work with transit agencies to make transit use more attractive to existing and potential customers, through right-of-way, sidewalk, and roadway improvements at transit stops, and safe and weather protected passenger waiting areas.

Discussion: New road projects will coordinate with the long term plans of the public transportation agencies, to provide pedestrian and transit facilities as required for future projects.

Policy T~~9~~7.~~11~~9: Develop rider information packages for commuter, transit, rail, and air transportation opportunities.

Discussion: The City website will provide links to carpooling, ride sharing programs, and other alternatives to single passenger cars.

Policy T7.10: Support and promote public involvement in Pierce Transit, King County Metro, and Regional Transit Authority decision-making.

Discussion: Promoting public involvement would allow decision makers hear the day to day needs of the travelling public, especially those would do not have the resources to own cars.

MOBILITY AND CAPACITY

GOAL T~~10~~8: Promote adequate capacity on roadways and intersections to provide access to homes and businesses.

POLICIES

Policy T~~10~~8.1:
Preserve and maintain capacity of roadways by:

- *Providing internal access between off-street parking areas in commercial areas through reciprocal agreements;*
- *Using intersecting streets as access points; or*
- *Designing subdivisions for efficient internal circulation.*

Discussion: Many safety and capacity problems relate to driveways that connect to public roads. The design of new street improvements should include provisions to consolidate existing accesses where feasible. Connecting commercial parking lots providing interior traffic flow off of public streets will lessen the number of driveway cuts on public streets and the number of potential traffic conflicts.

Policy T~~10~~8.2:
Identify, acquire, and preserve rights-of-way by methods including:

- *Requiring dedication of rights-of-way as a condition for development when the need for such rights-of-way is linked to the development;*
- *Requesting donations of rights-of-way to the public;*
- *Purchasing rights-of-way by paying fair value; and*
- *Acquiring development rights and easements from property owners.*

Discussion: Private vehicles are the most common mode of travel throughout the region. It is anticipated that the majority of vehicle trips within Pacific will continue to be private vehicles. The acquisition of right-of-way (ROW) will be crucial to ensure the safe flow of traffic and provide for faster response times for emergency services.

Policy T~~10~~8.3:
Continue to work with adjacent jurisdictions and stakeholders to develop major transportation corridors.

Discussion: Coordination with adjacent jurisdictions is necessary to ensure a safe consistent transportation system. For example, access to Lakeland Hills, a major residential area in Auburn, passes through three jurisdictions; Pacific, Sumner and Auburn. This is via Stewart Road/8th Ave. in Pacific and Sumner. This street is one of only two major east/west routes across the White River Valley connecting Lakeland Hills to SR 167. Coordination with Sumner and Pierce County has resulted in major road improvements to this road to provide greater capacity and safety.

Road Widening of Stewart Road

MULTIMODAL TRANSPORTATION

GOAL T~~11~~9: Provide for all multimodal means of transportation in a safe, compatible and efficient manner.

POLICIES

Policy T~~11~~9.1:
Develop a curb ramp program to install wheelchair ramps at all curbed intersections.

Discussion: Most transportation funding is provided by either State or Federal agencies. These funding programs require that all ramps are compliant with current ADA guidelines.

Policy T~~11~~9.2:
Work with neighboring jurisdictions and other agencies to ensure that Pacific's bicycle routes and corridors are safe, functional, compatible, and interconnected.

Discussion: The City has worked with regional partners to obtain grant funding for non-motorized facilities of regional significance. The City will continue to pursue these funding sources until the network is complete.

Policy T~~11~~9.3:
Plan for the expansion of appropriate road shoulders to maintain safe areas for walking, jogging, and biking.

Discussion: Expansion of impervious surfacing requires an expansion of stormwater facilities. The city needs to develop the long term pedestrian network that permits low impact or pervious surfacing alternatives.

Policy T~~11~~9.4:
Accommodate the needs of bicyclists and pedestrians in the design and construction of all appropriate roadway improvements, with safety and traffic flow as primary considerations.

Discussion: Most transportation funding is provided by either State or Federal agencies. Most of these funding programs require that pedestrian facilities are provided to serve the stakeholder needs. The design of roadway improvements can reduce barriers and increase safety for bicyclists and pedestrians. The location and design of walkways and trails should vary depending on adjacent land uses.

Policy T~~11~~9.5:
Work with King County Metro, Pierce Transit, Sound Transit, and businesses to evaluate and improve transit service and facilities that serve employment sites. Promote transit connections between local and regional high density-population centers and the Sumner-Pacific MIC.
Discussion: The City website will provide links to carpooling, ride sharing programs, and other alternatives to single passenger cars, including regional transit programs. The City's elected officials and staff currently participates in regional transportation planning groups.

Policy T~~11~~9.6:
Support public and private Transportation Demand Management (TDM) programs to promote alternatives to driving alone. Encourage Commute Trip Reduction (CTR) programs for businesses in the Sumner-Pacific MIC and other areas.

Discussion: The City website will provide links to carpooling, ride sharing programs, and other alternatives to single passenger cars, including regional transit programs. The City elected officials and staff currently participate in regional transportation planning groups. To implement this policy, the City will work with major employers, such as schools and retail centers, to provide incentives for carpooling, transit use, non-motorized transportation, and telecommuting. The City can also support educational programs that communicate transportation options.

Policy T~~11~~9.7:
Encourage new commercial, office and industrial developments to provide physical features supportive of carpooling, transit, and non-motorized modes of travel.

Discussion: To implement this policy, the City will work with major employers, such as schools and retail centers, to provide incentives for carpooling, transit use, non-motorized transportation, and telecommuting. For example, the provision of secured bicycle racks may help entice employees to ride

their bikes to work. The City can also support educational programs that communicate transportation options.

Policy~~:~~ T11**9**.8:
The high density Urban Transit Center adjacent to the proposed Sumner-Pacific Station, which includes a mixture of urban transportation modes, should serve the Sumner-Pacific MIC and other areas of the City.

Discussion: The City website will provide links to carpooling, ride sharing programs, and other alternatives to single passenger cars, including regional transit programs. The City's elected officials and staff currently participate in regional transportation planning groups. Examples can include preferential parking for carpools, vanpools and bicycles; transportation information and bus schedules, special loading and unloading areas for transit, carpools, and vanpools; and strong pedestrian linkages to off-site destinations.

SAFETY

GOAL T~~12~~10: Minimize transportation conflicts to ensure safety.

POLICIES

Policy T~~12~~10.1:
Conduct studies of high accident locations to support operational changes and designs that improve safety.

Discussion: Most transportation funding is provided by either State or Federal agencies. These funding programs require that a safety analysis be performed at critical areas. A warrant study is developed to determine intersection control needs as well as an evaluation of other elements that may be needed to improve safety.

Policy T~~12~~10.2:
Maintain and enhance the safety of roads in the City of Pacific.

Discussion: Examples of methods to improve safety include access management, improved signalization, left-turn-only arrows; center left turn lanes, turn prohibitions, median islands, lighting, and other techniques. (Note: City insurance rates drop with improved safety.) Most transportation funding is provided by either State or Federal agencies. These funding programs require that a safety analysis be performed at critical areas. A warrant study is developed to determine intersection control needs as well as an evaluation of other elements that may be needed to improve safety.

~~**GOAL T13: Protect the livability and safety of residential neighborhoods from the adverse impacts of motor vehicles.**~~

Policy T~~13~~10.~~1~~3:
Work with residents to encourage preservation of neighborhood character and safety on residential streets.

Reducing speeds and cut-through traffic can protect the livability and safety of residential neighborhoods. The City should explore a program whereby neighborhoods can buy traffic calming devices. The City should involve the Valley Regional Fire Authority and the Pacific Police Department in the implementation of this policy.

MAINTENANCE

GOAL T~~14~~11: Assign a high priority to meeting the maintenance needs of the transportation system so that it is safe and functional.

POLICIES

Policy T~~14~~11.1:
Develop a regular maintenance schedule for all components of the transportation infrastructure.

Discussion: The City currently contracts with King County for annual maintenance of traffic signals. The City public works crew evaluates street surfaces monthly as part of the street sweeping program. Long term road maintenance programs are in development. However, until there is a Transportation Benefit District or similar mechanism developed, there is no long term funding source for street maintenance. The City should base maintenance schedules on considerations for safety and resource conservation.

Policy T~~14~~11.2:
Encourage the maintenance and improvement of the street system when addressing the transportation and circulation concerns of the community.

Discussion: The City currently contracts with King County for annual maintenance of traffic signals. The City public works crew evaluates street surfaces monthly as part of the street sweeping program. Long term road maintenance programs are in development. However, until there is a Transportation Benefit District or similar mechanism developed, there is no long term funding source for street maintenance.

Policy T~~14~~11.3:
Develop strategies necessary to improve public streets to meet applicable road standards.

Discussion: The City public works crew evaluates street surfaces monthly as part of the street sweeping program. Long term road maintenance programs are in development. However, until there is a Transportation Benefit District or similar mechanism developed, there is no long term funding source for street maintenance.

LAND USE AND TRANSPORTATION

GOAL T~~15~~ 12: Ensure that transportation system improvements are compatible with adjacent land uses and will minimize potential conflicts.

POLICIES

Policy T~~15~~12.1:
Consider a complementary roadway pattern to increase accessibility to higher use areas and minimize traffic impacts on residential areas.

Discussion: Private vehicles are the most common mode of travel throughout the region. It is anticipated that the majority of vehicle trips within Pacific will continue to be private vehicles. The City will need to modify the transportation network to meet the needs of increased demand. In addition, the City has a strong desire to maintain the existing street network.

Policy T~~15~~12.2:
Employ a functional roadway classification system and guidelines to:

- *Control access to roads from adjacent developments;*
- *Route arterials and major collectors around residential neighborhoods;*
- *Prevent new residential areas from fronting on arterials;*
- *Incorporate transit, pedestrian, and bicycle access into major developments;*
- *Provide landscaping and noise buffers along major roadways;*
- *Provide facilities for bicyclists and pedestrians, and to access transit;*
- *Encourage changes to site plans to encourage pedestrian travel; and*
- *Improve pedestrian and vehicle circulation.*

Discussion: The City should adopt a street grid classification system that would minimize pass through commercial traffic within defined residential neighborhoods. Where pass through traffic does occur, appropriate speed limits to help reduce the impact of traffic conflicts should be considered.

Policy T~~15~~12.3:
Increase the visual ambiance along the Ellingson and Stewart Road corridors.

Discussion: This policy can be achieved through the requirement of street landscaping both within and outside of the right-of-way. Commercial design standards developed to complement the landscaping should be considered.

Policy T~~15~~12.4:
Develop and encourage programs, such as "adopt-a-road," to assist in keeping roadsides and trails free of litter.

Discussion: Adopt-a-road programs have proved successful on state highways to help decrease the amount of litter along those roads. The City should identify heavily travelled roads within the City where an "adopt-a-road" program may be successful. Removing litter from these roads will enhance the overall image of the City.

NON-MOTORIZED

GOAL T~~16~~13: Provide clear and identifiable systems of walkways, sidewalks, and trails to develop an environment that will make the use of alternative transportation modes an attractive and viable option.

POLICIES

Policy T~~16~~13.1:
Pacific shall investigate transportation routes and means for non-motorized transportation between neighborhoods and with neighboring cities.

Discussion: The City working on a system of pedestrian/bike trails throughout the City that connect existing neighborhoods and with other jurisdictions. As street improvements are considered, the provision for bike lanes is considered based on the width of the right-of-way and the classification of the road. As part of new development, projects adjacent to the projected route of the Interurban Trail are required to construct that portion of the trail along their property.

Policy T~~16~~13.2:
Provide signals for pedestrians, and install mid-block crossings where appropriate.

Discussion: The City should evaluate its street system do determine where mid-block crossings may be necessary based upon the length of block and the businesses fronting either side of the street. A signal crossing should also be considered on Stewart Road for pedestrians and cyclists using the Interurban Trail.

Policy T~~16~~13.3:
Development in the Neighborhood Center should have non-motorized access and include characteristics such as limited setbacks, pedestrian-oriented streetscapes, and appropriate pedestrian crossings.

Discussion: New development within the Neighborhood Center should be designed to have access to the Interurban Trail located in the west of the Neighborhood Center through the provision of designated bike lanes on 3rd Ave. (this has been completed). This bike lane should also connect with the potential new pedestrian trail to be provided as part of the proposed levee improvements on the right bank of the White River in Pacific to be completed in 2017/2018.

Policy T~~16~~13.4:
Provide a planned system of Linear Park Trails for pedestrians and bicyclists.

Discussion: A Linear Park Trails System can serve both a recreational and a transportation function and enhance community character. This will be a system of "green streets" to connect parks, open space, recreation areas, transit, trails, schools, and shopping. To implement this policy, the City should preserve rights-of-way for future non-motorized trail connections and utilize utility easements for trails when feasible. The City can provide systems of walkways and trails through some of the following methods:

- Working with school districts to identify and construct high priority pedestrian and bicycle school routes.
- Requiring new commercial and multi-family developments to construct sidewalks or trails.
- Assisting neighborhoods in forming Local Improvement Districts (LIDs) for sidewalk or trail construction.

Policy T~~16~~13.5:
As general guidelines, give priority to improvements to the walkways and trails systems that:

- *Increase public safety,*
- *Construct missing links in the existing bicycle and pedestrian system,*
- *Upgrade existing walkways and trails,*
- *Are along arterial streets, and*
- *Connect to key destinations.*

Discussion: Information on costs and benefits of improvements will be included in a walkway and trail plan to assist the City Council and Planning Commission in establishing funding priorities. The City will continue to explore opportunities to expand the pedestrian and bicycle system were appropriate with the development of properties adjacent to potential pedestrian and bicycle corridors.

Policy T~~16~~13.6:
The City shall continue to support the expansion of the Interurban Trail as an integral part of the regional transportation system.

Discussion: The City has regularly pursued grants to complete the Interurban trail. The completion of the trail has been designed to a fifty percent (50%) level. This provides a level of detail to pursue funding. However, the critical areas criteria change periodically requires additional funds for project mitigation. Expansion of the Interurban Trail will also be required as new development locates adjacent to the projected route of the Interurban Trail.

A portion of the Interurban Trail completed as part of the UPS development project.

Policy ~~16~~13.7:
The City shall seek to accommodate bicycles in its management and design of the City street network.

Discussion: Based on right-of-way widths and the roads functional classification, the City will continue to determine where bicycle lanes would be warranted to provide non-motorize commuting options.

Policy ~~16~~13.8:
The City shall encourage the inclusion of convenient and secure bicycle storage facilities in all large public and private developments.

Discussion: Given the City's commitment to provide non-motorize commuting options, the City should explore regulatory options to require new development to provide bicycle storage options (for example, secured bicycle racks) as part of new development and for public properties.

FINANCING

GOAL T~~17~~14: Secure funding to ensure an adequate roadway network that meets the City's LOS policy

POLICIES

Policy T~~17~~14.1:
Funding efforts shall include:

- *Identifying and pursuing long-term strategies to obtain grant funding.*
- *Maximizing opportunities for grant awards by matching project objectives with revenue sources and developing joint projects with neighboring jurisdictions and other agencies.*
- *Supporting efforts at the state and federal levels to increase funding for transportation systems.*

Discussion: The City will continue to try to secure grant funding for road improvements. Potential funding sources include the following.

Policy T~~17~~14.2:
Balance financing of roadway improvements between existing and future users based on the principle of proportional benefit.

Discussion: Existing gas taxes and motor vehicle registration fees are not sufficient to meet the financial needs of Pacific's transportation system. Other funding methods should be developed that are equitable and consistent with the benefits derived from improvements. Examples include, but are not limited to:

- Road Improvement Districts,

- LIDs,
- public/private partnerships,
- impact fees

The funding programs must be adequate to allow transportation improvements to be implemented concurrently with development. New development must pay a fair share of the cost to serve it.

Policy T~~17~~14.3:
Require that all road projects be adequately funded to include all required public safety and design standards.

Discussion: The City has adopted design standards for roads that includes the required safety and design standards to protect the public.

Policy T~~17~~14.4:
Identify and pursue long-term strategies to obtain grant funding.

Discussion: The City should maximize opportunities for grant awards by matching project objectives with revenue sources and developing joint projects with neighboring jurisdictions and other agencies. Potential funding sources include the following:

ROADS
State Funding
Transportation Improvement Board (TIB) – New and Preservation

Federal Funding
Surface Transportation Program (STP) – New and Preservation
Congestion Mitigation and Air Quality Program (CMAQ) - New

TRAILS
State Funding
WSDOT Pedestrian and Bicycle Safety – New

Federal Funding
Surface Transportation Program (STP) – New

Policy T~~17~~14.5:
Develop interlocal agreements with neighboring jurisdictions and other agencies to develop funding sources for transportation improvements.

Discussion: The City should work with other agencies to mitigate the impacts of new development, coordinate joint projects, and establish a program for the maintenance of common corridors. The City can share transportation resources and reduce overlap in transportation expenditures through interlocal agreements. The City is coordinating with the City of Sumner to complete the Stewart St. /8th Ave. corridor improvements. Coordination is critical between the City and the City of Sumner to obtain funds

to complete the corridor improvement across the White River which requires the construction of a new bridge.

~~**GOAL T18: Prioritize transportation expenditures.**~~

Policy ~~T18~~T14.~~16~~6:
Prioritize transportation expenditures in the following manner within current municipal boundaries:

1. *Correct known safety hazards in the road system and improve traffic operations through low cost improvements;*
2. *Maintain the existing transportation system to prevent deterioration of facilities and avoid the need for major reconstruction of roads and bridges;*
3. *Widen existing or construct new roadways to alleviate current capacity problems and to accommodate increases in traffic.*

Discussion: The City should develop a maintenance program to inventory the condition of City streets which would allow the City to project potential maintenance costs which would allow the City to implement a yearly maintenance program based on projected yearly revenues.

Policy ~~T18~~T14.~~27~~7:
Use a standardized, well documented, and objective process to establish priorities for transportation expenditures within the City's UGAs.

Discussion: A standardized process will help the City determine additional City expenditures that would be necessary when annexation within the Urban Growth Area occurs.

Policy ~~T18~~T14.~~38~~8:
Allocate resources in the City TIP and City Capital Facilities Funding Plan according to the prioritization guidelines listed in the Capital Facilities element.

Discussion: The City will implement this policy through its TIP and concurrency management program.

GOAL T~~19~~15: Respond to unanticipated circumstances and conditions that require modification of adopted plans or standards. These changes may be cultural, economic, environmental, or in another form that affects the transportation system.

POLICIES

Policy T~~19~~15.1:
Annually update the TIP to reflect changes in revenue availability and roadway system needs.

Policy T~~19~~15.2:
Develop a concurrency management program and revise it as part of the annual amendment process for the Comprehensive Plan.

Discussion: The intent of the concurrency management program is to ensure funding for transportation improvements needed to support new development and maintain adopted transportation LOS.

Policy T~~19~~15.3:
In the event that the City is unable to fund the transportation capital improvements needed to maintain adopted transportation LOS standards, pursue one or more of the following actions:

- *Phase development that is consistent with the Land Use element until resources can be identified to provide adequate improvements;*
- *Revise the Land Use element to reduce the traffic impacts to the degree necessary to meet adopted transportation service standards;*
- *Reevaluate the City's adopted transportation LOS standards to reflect levels that can be maintained, given known financial resources;*
- *Require new and existing development to implement measures to decrease congestion and enhance mobility; and/or*
- *Place a moratorium on development in affected areas.*

Policy T~~19~~15.4:
Analyze and strongly consider the use of development impact mitigation fees.

GOAL T~~20~~16: Support a continuous, cooperative, and comprehensive regional transportation planning process

POLICIES

Policy T~~20~~16.1:
Support the comprehensive transportation process conducted by the PSRC pursuant to its designation as the Puget Sound's Metropolitan Planning Organization.

Discussion: The PSRC is the primary forum for the development of regional transportation and strategies. The City is required to submit this Transportation element to the PSRC for review and certification of conformity with the Metropolitan Transportation Plan, as dictated by county, state, and federal guidelines.

Policy ~~T20~~T16.2:
Aggressively pursue improvements to the State Highway~~s~~ that run~~s~~ ~~in or near~~through Pacific. The improvements can include:

- Capacity increases;
- HOV lanes or transit enhancements;

- ~~Improved pedestrian facilities, such as sidewalks, pedestrian crossings, and bus zone improvements;~~
- Interconnected and computerized signal systems, set for specific speeds; or
- Street lighting.

~~**Policy T20.3:**~~
~~*Work with King and Pierce counties to make sure bottlenecks do not occur in Pacific*~~.

3. TRANSPORTATION INVENTORY

This inventory addresses the transportation network located within the City, including those which are the responsibility of the Washington State Department of Transportation (State Route 167 in King or Pierce County).

Roadways

Roadway Classification

~~Figure~~ Map 8.1 depicts the functional classification of the arterial roadway system serving the study area. Identification of the roadway functions is the basis for planning roadway improvements and the appropriate standard (right-of-way width, roadway width, design speed) that would apply to each roadway facility. The following definitions serve as a general guide in determining street classifications.

Principal Arterials - Intercommunity roadways connecting primary community centers with major facilities. Principal arterials are generally intended to serve through traffic. It is desirable to limit direct access to abutting properties.

Minor Arterials - Intercommunity roadways connecting community centers with principal arterials. In general, minor arterials serve trips of moderate length. Access is partially controlled with infrequent access to abutting properties.

Collector Arterials - Streets connecting residential neighborhoods with smaller community centers and facilities as well as access to the minor and principal arterial system. Property access is generally a higher priority for collector arterials; through-traffic movements are served as a lower priority.

State-owned transportation facilities and highways of statewide significance

In 1998, the Washington State Legislature enacted the "Level of Service Bill" (House Bill 1487) which amended the Growth Management Act (GMA) to include additional detail regarding state-owned transportation facilities in the transportation element of comprehensive plans. Within Pacific, State Route 167 (SR 167) has been designated as a Highway of Statewide Significance (HSS) in WSDOT's Highway System Plan (HSP). SR 167 provides the major north-south regional connection between Renton and the City of Puyallup. It connects to Interstate 405 in Renton, ~~and to~~ SR 18 in Auburn and SR 410 in Sumner. Through Pacific, SR 167 is a full

SR 167 from Pacific West Hill

limited access four lane freeway with interchanges at Ellingson ~~Avenue~~ Road ~~and~~ and Stewart Road. It is classified as an urban principal arterial.

Local Transportation System

The City of Pacific transportation network consists of one freeway, four major arterials, several minor arterials and local access streets. The major arterials form a square roughly at the east-west and north-south boundaries of the city. There are several features (the White River, two rail lines, ~~and~~ SR 167 and the steep slopes of West Hill) that limit east-west travel in the vicinity. The following is a listing and brief description of the major roadways serving the City of Pacific:

SR 167 is a north-south limited access freeway that extends from the City of Tacoma to the City of Renton. The roadway (also called Valley Freeway) has two lanes in each direction separated by a center median. Interchange access is provided at Ellingson Road and Stewart Road. The posted speed limit is 60 mph.

Ellingson Road is an east-west major arterial that runs from West Valley highway to East Valley Highway. The roadway has two lanes in each direction with curbs and sidewalks along most of the roadway. Traffic signals are present at intersections with Frontage Road, Milwaukee Boulevard, Pacific Avenue, C Street and A Street/East Valley Highway (in the City of Auburn).

Stewart Road is an east-west major arterial that extends from West Valley Highway to Butte Avenue in Pacific. The roadway is called 8th Street east of the City of Pacific and Jovita Boulevard west of the ~~e~~City limit. The roadway has a one lane in each direction with a left-turn lane between West Valley Highway and SR 167. East of SR 167 the roadway has one lane in each direction with left turn lanes being installed at Valentine Avenue intersection. The intersections with West Valley Highway and Valentine Avenue are under traffic signal control.

West Valley Highway is a north-south major arterial that runs parallel to and just west of SR 167. The roadway has a single lane in each direction with minimal shoulders and a 40 mph speed limit. Much of the roadway has poor pavement condition.

Milwaukee Boulevard and Valentine Avenue are north-south minor arterials that, combined, provide a continuous connection from Ellingson Road to the south city limit. Milwaukee Boulevard has a single lane in each direction with full urban improvements from 3rd Avenue to the north.

Valentine Avenue is a narrow roadway with a single lane in each direction and minimal shoulders. North of Roy Road the roadway is signed for local access only. The roadway ends at 5th Avenue SE, offset approximately 500 feet from where Milwaukee Boulevard begins.

3rd Avenue South is a two lane roadway that extends east-west between Skinner Road and West Valley Highway. The roadway is designated a minor arterial between West Valley Highway and the Pacific City Park. The roadway is generally wide with urban improvements between W. Valley & Pacific Avenue ~~S.~~S. The roadway is signed for local access only east of Frontage Road.

Pacific Avenue is a two-lane north-south minor arterial that extends from 4th Avenue SE, past Ellingson Road to 1st Avenue in Algona. The roadway is generally wide with urban improvements.

Frontage Road is a two-lane minor arterial that runs from 3rd Avenue SW, north into Algona. The roadway has urban improvements and on-street parking on both sides.

Public Transportation

Transit is an important alternative to automobile travel for either regional or local trips. Transit is not only useful in reducing traffic volumes and pollution, but is often the only means of transportation available to some members of the community.

Pacific's greatest need is for mobility between towns and to urban areas. King County Metro provides local and regional bus service within the City and to the north. Pierce Transit and Sound Transit also provide public transportation in the region. The City of Pacific is currently working with these agencies to enhance connections within the City limits to include possible consideration of a park and ride lot.

Rail

At one time the railroad was a vital link in the City providing both passenger and freight service. The City does not currently have passenger service, and within Pacific there is no reliance on the railway for freight service from the BNSF and Union Pacific (UPRR) railroads. The BNSF main line is used by Amtrak for through passenger rail service, and also by Sound Transit, which has stations in the cities of Auburn and Sumner, but no stops are provided in Pacific.

Non-motorized Facilities

The City's pedestrian and bicycle facilities include each of the three categories described in the Puget Sound Regional Council (PSRC) Pedestrian/Bicycle component of *Destination 2030*. These components include:

Category 1. Pedestrian and bicycle "travel chain" facilities which connect people to transit, ferry, and rail terminal from their origin to their destination.

Category 2. Linear "long haul" pedestrian/ bicycle facilities which connect parts of the region. These facilities can be further grouped into on-road facilities and separated pedestrian/bicycle rights-of-way or trails.

Category 3. Local "network" pedestrian and bicycle facilities in or near centers. These facilities have the potential for eliminating some short vehicle trips, which can benefit air quality and reduce congestion in some instances.

"Travel chain" facilities include sidewalks and shoulders on residential streets, used by pedestrians to reach the arterial streets served by bus routes. "Long haul facilities" include the sidewalks and shoulders of arterial streets, and the Interurban Trail, with its separate right-of-way and Trailhead at 3rd Avenue S.W., near SR167.

Continuity in pedestrian and bicycle access within the City provides for increased safety, comfort and ease for residents and recreational users. The City is striving to create a fully integrated system for these modes of transportation, yet recognizes the need to prioritize locations where it expects heavy use, such as routes connecting residential areas to recreational facilities and schools.

Regional pedestrian and bicycle traffic may use street-related facilities such as sidewalks, shoulders, and travel lanes or the Interurban Trail, which follows the Puget Power right-of-way to the north. The Trail's current southern terminus is in Pacific. Northbound pedestrian and bicycle traffic can reach Seattle from Pacific along the Interurban Trail.

Freight Mobility

Truck traffic is vital to Pacific's industrial and commercial growth, as it is the mode used for transportation between most of these enterprises and their suppliers and customers. Truck traffic comprises a significant percentage of the total traffic on SR 167, on Ellingson Road, W. Valley HWY, Stewart Road, and on Valentine Avenue.

Gravel pits on East Hill, outside Pacific, generate considerable through truck traffic. Up to 100 one-way dump tandem or center dump truck trips per hour have been counted on Ellingson Road during gravel pit operations. The warehouse/industrial area of the City of Sumner generates heavy impacts on Valentine Avenue and Stewart Road on movements to and from SR 167. The heavy truck traffic is significant not only because of its impact on traffic flow but because of the structural impact on Pacific's street system.

4. EXISTING CONDITIONS

Level of Service

The Level of Service (LOS) calculation is the means by which the operation of road systems is measured to assure that adequate facilities are present or planned and funded to accommodate development. Level of Service is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from LOS A (very little delay) to F (long delays, congestion). Agencies are required to adopt regulations prohibiting any development which would cause a facility to drop below identified standards.

Within the City of Pacific, Level of Service D has been established as the minimum acceptable standard for roadways and intersections.

Concurrency

For this plan, only roadway segments were analyzed for concurrency. The City requires development to analyze impacts to specific intersections at the time a development is approved. The City maintains a list of critical intersections to the local transportation network. Any developments proposing more than 25 new trips through any of these intersections will be required to prepare a Traffic Impact Analysis that identifies any deficiencies resulting from the development, and a plan for mitigating the deficiency.

Roadways that are failing are likely to include intersections that are failing as well. Additional detailed study should be done on roadways that indicate a capacity failure in order to determine the most appropriate form of improvement, including turn lanes and other intersection improvements.

Roadway Capacity Analysis

The current operation of the City of Pacific roadway network has been assessed using a 'link capacity' analysis. Each roadway in the city has a theoretical maximum vehicle carrying capacity for a given time frame. The functional classification, number of lanes, presence of traffic signals or turn-lanes are examples of features that affect the volume of traffic a particular roadway segment can handle.

For this study, the evening peak hour directional volumes were used as the basis for the LOS assessment.

The 'base year' link volumes for a representative sample of roadway segments were provided by the City of Pacific and the City of Auburn. The counts were mostly conducted in late 2003 and early 2004. The traffic counts on Stewart Road were collected in 1999.

The Level of Service criteria used in this analysis are based on Federal Highway Administration methodologies described in the Highway Capacity Manual. The 1998 Florida Department of Transportation (FDOT) Level of Service Handbook has provided tables of generalized roadway level of service criteria using the methodologies outlined in the Highway Capacity Manual. The generalized tables are used as a first screening process to determine which facilities may be experiencing capacity constraint.

More specific roadway or intersection analysis may be required before prioritizing or designing potential roadway improvements. The level of service tables used is shown on Table 8.1.

Table 8.1
Generalized Level of Service Criteria
Peak Hour Directional Volumes

Interrupted Flow Arterials - Class I (0 to 1.99 traffic signals per mile)				
	Maximum Traffic Volume at Level of Service			
Number of Lanes	B	C	D	E*
Two, Undivided without left-turn lanes	460	660	700	700
Two, Undivided with left-turn lanes	570	820	880	880
Four, Undivided without left-turn lanes	930	1,310	1,390	1,390
Four, Undivided with left-turn lanes	1,180	1,660	1,760	1,760
Major City/County Roadways				
	Maximum Traffic Volume at Level of Service			
Number of Lanes	B*	C	D	E
Two, Undivided without left-turn lanes	N/A	350	610	660
Two, Undivided with left-turn lanes	N/A	440	760	830
* Volumes are comparable because intersection capacities have been reached. ** Cannot be achieved.				

~~**Figure**~~ **Map 8.1**~~2 on the following page~~ at the end of this Chapter illustrates the City of Pacific's existing roadway network. ~~and PM peak hour traffic volumes for major roadway segments.~~ Table 8.2 illustrates the existing PM peak ~~T~~traffic volume data which was taken from several sources, including the City of Auburn, City of Sumner, and several development proposals. Existing and projected traffic counts in Tables 8.2, 8.3 and 8.4 are keyed to Map 8.3 at the end of this Chapter. The following table provides a summary of the current Levels of Service.

Table 8.2 Existing Roadway Level of Service (LOS)					
		Current PM Peak Hour Directional Volume		Roadway Capacity at LOS D	Level of Service (Peak Direction)
Roadway Segment		**EB** (Eastbound)	**WB** (Westbound)		
	~~Ellingson Road – East of C Street~~	~~1287~~	~~644~~	~~1,390~~	~~C~~
A	Ellingson Road – West of C Street	~~614~~775	~~771~~828	1,390	B
B	3rd Avenue S. - West of Milwaukee Blvd	~~238~~205	~~91~~78	610	C
C	3rd Avenue S. - East of West Valley Hwy	~~135~~148	~~49~~67	610	C
D	Stewart Road (8th Street) - East of Valentine Avenue (2)	~~519~~810	~~398~~543	700	D
E	Stewart Road (8th Street)- West of Valentine Avenue (2)	~~641~~709	~~691~~660	700	D
F	Stewart Road (8th Street) - West of SR 167 (3)	~~898~~667	~~545~~462	880	F
Roadway Segment		**NB**	**SB**		
G	Frontage Road – South of Ellingson Road	~~108~~189	~~186~~257	610	C
H	W Valley Hwy North of 3rd Avenue S.	~~78~~85	~~709~~624	700	~~F~~D
I	W Valley Hwy South of 3rd Avenue S.	~~78~~135	~~636~~596	700	D
J	Valentine Avenue - North of Stewart Rd (2)	~~91~~143	~~138~~377	610	C
K	Valentine Avenue - South of Stewart Rd (2)	~~123~~211	~~132~~227	610	C

(1) Auburn Traffic County 05/2014

(2) Sumner Meadows Redevelopment Report prepared by Transportation Engineering Northwest April 2014

(3) WSDOT traffic counts from 1/7/2014

(4) Pacific Traffic Counts from 11/2013

(5) King County 2/2007

Existing Traffic Operations

Based on the described criteria, most roadways in the City of Pacific have sufficient capacity for current transportation needs. The following roadways which have potential capacity problems identified are listed and described below.

Stewart Road (8th Street) between Valentine Avenue and West Valley Highway

Stewart Road (8th Street) provides a major connection to SR 167 for the industrial areas of the south end of the City of Pacific and the north end of the City of Sumner. Currently, Stewart Road has a single lane in each direction with left-turn lanes between West Valley Highway and the northbound ramps to SR 167. Between SR 167 and Valentine Road the roadway has single lanes in each direction with left-turn lanes at

Valentine **Avenue**. Stewart Road near SR 167 is experiencing a traffic demand slightly above capacity, and east of SR 167 the roadway is near capacity.

Roadway projects are planned in the area that will improve the operation of Stewart Road within the City of Pacific. The current Pierce County Transportation Improvement Program identifies a project (jointly with the City of Pacific and WSDOT) to widen Stewart Road (8th Street) to five lanes from West Valley Highway to East Valley Highway. Within the City of Sumner, east of the White River Bridge, the road widening has been completed. Within the City of Pacific, west of the White River Bridge, it is anticipated that the road widening project will be completed by September of 2015. The last phase of the road widening project will be the replacement of the two lane bridge over the White River with a four lane bridge. The City of Pacific and the City of Sumner will be jointly applying for grants to complete this phase of the project.

West Valley Highway between Stewart Road and Ellingson Road
This roadway provides one lane in each direction with no left-turn lanes at intersections. Based on the existing traffic demand the roadway is currently operating at a LOS ~~F~~ D condition. The operation of the roadway would be improved by providing left-turn channelization on West Valley Highway at major intersections. Site distance visibility also needs to be improved.

Intersection Improvements
Table 8.2, Existing Roadway LOS, indicates the general ability of the existing roadway network to handle current traffic loads. However, specific factors could cause localized difficulties at certain intersections or on short sections of roadway. Some of these factors could include the lack of turning lanes, and high levels of truck traffic.

If an isolated stop sign-controlled intersection experiences excessive delay or congestion, it may be appropriate to construct turn lanes or to improve the traffic control. Traffic control improvements could include implementing all-way stop control or constructing a traffic signal system. These types of isolated improvements are based on site-specific need and are not measures of the overall function of the transportation system. The implementation of intersection improvements is typically addressed in the 6-year planning efforts by the city and in Traffic Impact Analyses prepared for larger developments.

Other Improvements
In addition to intersection improvements, there are other measures that can be considered to improve the overall safety of **City** roadways. Potential safety measures may include:

- Widening the existing travel lanes
- Improving horizontal and vertical curves
- Constructing or widening shoulders
- Removing obstructions to improve sight distances
- Road surface maintenance
- Constructing turn lanes at intersections
- Constructing sidewalks or bike lanes
- Adding street lighting

Demand Management and Trip Reduction Strategies
In addition to capacity and safety enhancements to the existing system, the City also encourages managing demand on its facilities. This includes provision of non-motorized facilities such as bike and

pedestrian paths and sidewalks, trail networks, and connections between modes such as auto and transit. The City would like to include better access to transit through increased bus service, and by providing a park and ride lot to connect with regional and local routes served by King County Metro, Sound Transit, and Pierce Transit.

5. PLANNED IMPROVEMENTS

A review of other agency Transportation Improvement Plans (TIP) provided the following list of projects that will affect the study area:

WSDOT

~~The Highway Construction Capital Improvement & Preservation Program lists the following projects that will affect the study area:~~

SR167
8th to 277th Southbound HOT Lane
WSDOT awarded a contract for extending the existing HOT/HOV lanes on SR 167 from 37th Street NW in Auburn to Stewart Road (Eighth Street East) in Pacific. HOT (High Occupancy Toll) lanes are lanes that are open to carpools, vanpools, transit and toll-paying solo drivers. In addition to preserving priority status for transit, HOT lanes allow solo drivers to use the surplus capacity in the lanes by paying a toll. Tolls for HOT lanes are set to ensure that these lanes keep flowing even when the regular lanes are congested

City of Sumner
136th Widening Project
In partnership with the City of Pacific, the City of Sumner as project lead, is managing the 136th Street/Valentine Ave. S reconstruction project proposed for completion in Spring 2016.

8th Street East - White River Bridge:
This project will widen the bridge over White/Stuck River and is a joint project with Pierce County. The City is in the design and pursuing construction funding. Anticipated completion is Fall 2018.

City of Auburn
Lake Tapps Parkway Preservation
This project will repair and overlay the existing travelled surface of Lake Tapps Parkway. This street is an extension of Stewart Road (8th St E).

A Street SE Non-Motorized Access Improvements
This project will improve pedestrian access in the A street corridor, a portion of which will pass through the City of Pacific.

King County
There are no scheduled projects in the Pacific vicinity on the current county TIP.

Pierce County
There are no scheduled projects in the Pacific vicinity on the current county TIP.

City of Pacific 6-Year Transportation Improvement Plan **(TIP)**
The City of Pacific has transportation projects in various stages of development. These projects can be viewed within the current year Transportation Improvement Plan.

Planned Improvements and the Future Network
These improvements are included in the roadway networks for the future conditions analysis for 2010 and 2025 in the following sections.

6. FUTURE CONDITIONS

Traffic Volume Projections

To assess the future transportation needs of the City of Pacific, and the ability of the existing roadway network to accommodate planned growth, traffic volumes were estimated for the ~~2010~~ 2021 and ~~2025~~ 2035 horizon years. The traffic volume projections were prepared using the Pierce County model with Sumner and Bonney Lake enhancements. The transportation model was created using a computerized transportation network model program.

Forecasting Methodology

Traffic volume forecasts for Transportation Element of the Comprehensive Plan were developed using a traffic volume growth rate determined to be appropriate based on available data. Three different data sources were consulted in order to identify an appropriate growth rate and forecast traffic volumes in Pacific:

- Historical traffic volume data from the Washington State Department of Transportation (WSDOT) on State Route (SR) 167.
- Long-range 2030 forecasts of population and employment by the Puget Sound Regional Council (PSRC).
- Pierce County travel demand model data for 2004 and 2025.

~~The City of Pacific study area was modeled using the Emme/2 software package. Existing land use and demographic information was provided by the City of Pacific, adjacent communities and Pierce County.~~

~~The modeling process developed for this study involved four major steps:~~

- ~~Construction of a computerized street network system of the Pierce County transportation system~~
- ~~Developing a computerized land use zone system and database inventory of households and employment~~
- ~~Preparing base year model traffic volumes using trip generation factors and land use types to calibrate the model to current conditions~~
- ~~Developing future traffic volumes using projected land use changes~~

~~*Model Post-Process Calibration*~~

~~The transportation model has been calibrated to a high degree of accuracy for the system-wide roadway network. However, the accuracy of model volumes for particular roadway segments may vary based on a variety of factors. To account for the occurrence of local variation, a 'post-process' calibration was applied to the model-generated traffic volumes.~~

~~The post-process calibration involved calculating the difference between the model-generated volumes for the 2000 base year and for the 2020 horizon year. This difference is considered the model volume growth increment. The model volume growth increment was then added to the actual traffic volume counts for each roadway segment. Similarly, the 2010 traffic volume scenario was calculated by applying~~

~~a percentage of the model growth increment to the actual traffic counts.~~

~~For roadways not represented in the Pierce County model, the model growth increment was not available. For those roadways model growth rates were calculated for nearby roadways in the model network and then applied to the individual roadways in the City of Pacific study area.~~

Future Conditions (6 Year)

The City of Pacific annually develops a Transportation Improvement Program (TIP) to address roadway deficiencies. As described previously, the deficiencies can be capacity or safety related. Most of the improvements included in the 2014 6-year TIP are intended to address safety-related deficiencies or pavement restoration. Each annual update is hereby adopted by reference in the transportation element of the county Comprehensive Plan and is available through the Public Works Department.

6-Year Horizon Traffic Volumes

~~**Figure**~~ **Table 8.3** shows estimated traffic volumes for the ~~2010~~ 2025~~1~~ horizon. Map 8.3 illustrates ~~alphabetically the location of the~~ estimated traffic volumes as shown in Tables 8.3 and 8.4.

The following table shows the estimated traffic volumes and Level of Service for the ~~2010~~ 2025 horizon year. The capacity value for the Stewart Road (8th Street) corridor reflects the planned roadway widening project.

Table 8.3
Projected ~~2010~~ 2021 Roadway Level of Service (LOS)

		Projected ~~2010~~ 2021 PM Peak Hour Directional Volume		Roadway Capacity at LOS D	Level of Service (Peak Direction)
Roadway Segment		EB	WB		
A	Ellingson Road – West of C Street	~~676~~ 945	~~822~~ 1,009	1,390	~~B~~ C
B	3rd Avenue - West of Milwaukee Blvd	~~264~~ 250	~~119~~ 95	610	C
C	3rd Avenue - East of West Valley Hwy	~~167~~ 180	~~72~~ 82	610	C
D	Stewart Road (8th Street) East of Valentine Avenue	~~685~~ 987	~~561~~ 662	1,760	B
E	Stewart Road (8th Street) - West of Valentine Avenue	~~747~~ 864	~~789~~ 805	1,760	B
F	Stewart Road - West of SR 167	~~1006~~ 813	~~610~~ 563	~~1,760~~ 880	B C
Roadway Segment		NB	SB		
G	Frontage Road – South of Ellingson Road	~~134~~ 230	~~231~~ 313	610	C
H	W Valley Hwy North of 3rd Avenue	~~92~~ 104	~~687~~ 761	700	~~D~~ E
I	W Valley Hwy South of 3rd Avenue	~~87~~ 165	~~611~~ 727	700	~~C~~ E
J	Valentine Avenue - North of Stewart Road	~~110~~ 143	~~167~~ 377	~~610~~ 880	~~C~~ B
K	Valentine Avenue - South of	~~111~~ 257	~~136~~ 277	~~610~~ 880	~~C~~ B

	Stewart Road				

Projected ~~2010~~ 2021 Traffic Operations

Based on the described criteria, most roadways in the City of Pacific will have sufficient capacity to accommodate the increase in traffic anticipated over the next six years.

Recommended Improvements - Roadway Capacity

Ellingson Road Corridor Study
The City should consider analyzing the Ellingson Road corridor for possible access control and left turn access measures. It is possible that the road could be re-striped as a 3-lane roadway with a center left turn lane. This would improve access into adjacent industrial and commercial properties and increase the efficiency of through traffic. Additional study is required before making any specific improvements.

West Valley Highway Corridor Study
The City should consider analyzing the West Valley Road corridor. Although traffic forecasts predict a slight reduction in volumes on the roadway, possibly due to the addition of the 167/24th interchange, further analysis is required to determine the accuracy of the model forecast and consider potential access control and left-turn provisions. West Valley Highway will continue to function at LOS E due to spillover traffic from SR 167 during PM peak hours. This may be relieved once the Department of Transportation extends the "hot lanes" further south to the Stewart Road/8th Street corridor.

Intersection Improvements

While the roadways within the City appear to be adequate in terms of capacity, it is possible that intersections along some of those roadways may experience failure. Additional intersection analysis will be done as development proposals are submitted.

Safety and Maintenance

Although most of the current roadway system has adequate capacity, the city will continue to upgrade roadways to improve various safety elements. Roadway improvements may also be constructed to improve access to appropriately zoned lands to encourage economic Development.

~~Figure 4~~ Table 8.4 ~~2025~~ 2035 Traffic Volumes

Projected ~~2025~~ 2035 Traffic Operations

As **Table 8.4** indicates, most of the existing roadways will continue to function at an acceptable LOS through the ~~2025~~ 2035 horizon.

There are no additional recommended improvements beyond those identified in 20~~10~~35. However, the City should continue to monitor impacts to specific critical intersections.

Table 8.4 Projected ~~2025~~ 2035 Roadway Level of Service (LOS)					
		Projected ~~2025~~ 2035 PM Peak Hour Directional Volume		Roadway Capacity at LOS D	Level of Service (Peak Direction)
Roadway Segment		EB	WB		
A	Ellingson Road – West of C Street	~~809~~ 1152	~~932~~ 1239	1,390	C
B	3rd Avenue - West of Milwaukee Blvd	~~319~~ 305	~~180~~ 116	610	C
C	3rd Avenue - East of West Valley Hwy	~~234~~ 220	~~121~~ 100	610	C
D	Stewart Road (8th Street) East of Valentine Avenue	~~1134~~ 1204	~~1005~~ 807	1,760	~~B~~ C
E	Stewart Road (8th Street) - West of Valentine Avenue	~~1035~~ 1054	~~1056~~ 981	1,760	~~B~~ C
F	Stewart Road (8th Street) - West of SR 167	~~1347~~ 991	~~818~~ 687	1,760	~~D~~ B
Roadway Segment		NB	SB		
G	Frontage Road – South of Ellingson Road	~~203~~ 281	~~350~~ 382	610	D
H	W Valley Hwy North of 3rd Avenue	~~123~~ 126	~~640~~ 927	700	~~C~~ F
I	W Valley Hwy South of 3rd Avenue	~~108~~ 201	~~558~~ 886	700	~~C~~ E
J	Valentine Avenue - North of Stewart Road	~~161~~ 212	~~245~~ 560	610	~~C~~ B
K	Valentine Avenue - South of Stewart Road	~~80~~ 314	~~146~~ 337	610	~~C~~ B

Future Conditions (~~2025~~2035)

Site-Specific Traffic Impact Analyses

There are ~~currently several~~very few ~~-~~proposals for development projects within the City. ~~If these occur, potentially a large amount of residential and commercial infill planned for the city could occur within a concentrated area. Therefore,~~ The City ~~is~~ has ~~establishing~~ established a Traffic Impact Analysis process to ensure consistency in identifying and analyzing impacts.

All large developments are required to prepare a Traffic Impact Analysis (TIA) of the projected traffic conditions expected at the completion of the proposed development. The TIA would identify if additional roadway improvements are needed to accommodate the new traffic generated by the specific

development. The TIA for each successive development in a localized area would be required to include the estimated traffic from all of the other planned developments that were currently in the permitting process.

If the cumulative effect of development causes specific roadways or intersections to operate at less than acceptable standards, roadway improvements would need to be funded or constructed by the developer that would improve the operation of the roadway network to an acceptable level.

Developments proposed within the area will be responsible for providing more detailed analysis of intersections and roadways impacted by the development. The following is a list of intersections that are considered critical locations to the overall function of the City of Pacific roadway network:

Critical Intersections

Ellingson Road Corridor

Ellingson Road/West Valley Highway

Ellingson Road/State Route 167 Southbound Ramp Terminals

Ellingson Road/State Route 167 Northbound Ramp Terminals

Ellingson Road/Frontage Road

Ellingson Road/Tacoma Boulevard

Ellingson Road/Milwaukee Boulevard

Ellingson Road/Pacific Avenue

Ellingson Road/C Street

3rd Avenue Corridor

3rd Avenue/West Valley Highway

3rd Avenue/Frontage Road

3rd Avenue/Chicago Boulevard

3rd Avenue/Milwaukee Boulevard

3rd Avenue/Butte Avenue

3rd Avenue/Pacific Avenue

Valentine Avenue Corridor

Valentine Avenue/5th Avenue **SE**

Valentine Avenue/Stewart Road

Stewart Road Corridor

Stewart Road/West Valley Highway

Stewart Road/State Route 167 Southbound Ramp Terminals

Stewart Road/State Route 167 Northbound Ramp Terminals

Stewart Road/Thornton Avenue

Stewart Road/Valentine Avenue

~~*Figure*~~ *Map 8.4~~5~~ shows the critical intersections.*

Traffic Impact Analyses prepared for new developments would be required to provide analysis of any critical intersection impacted by 25 or more new PM peak hour trips. Analysis of additional intersections could be required at the discretion of City of Pacific staff.

Truck Traffic and Circulation

The City of Pacific has a successful and growing industrial land base. Consistent with the industrial land-use is elevated levels of truck traffic. Current strategies are in place to provide distinct truck routes to minimize the conflict with residential and non-industrial commute traffic. The recommended truck primary routes are shown on ~~**Figure**~~ **Map 8.5~~6~~**. Traffic Impact Analyses prepared for commercial/industrial developments will be required to identify the amount of truck traffic that will be generated by the project during the morning and evening peak hours and average weekday.

For purposes of this analysis 'truck' is defined as any vehicle with a gross vehicle weight rating over 10,000 pounds and would include most combination and multiple-axle vehicles. The following levels of truck traffic would be deemed a significant increase according to the following guidelines.

The developer would be required to include with the Traffic Impact Analysis a pavement analysis for each roadway receiving an increase in truck traffic in excess of the limits defined above to determine if the roadway can accommodate the increase in truck loading.

Table 8.5
Significant Truck Traffic Levels
For New Developments

	Average Daily Volume
Designated Truck Routes	100
All other Streets	10

7. RCW 47.06.140 ~~HB 1487~~ COMPLIANCE (STATE FACILITIES)

The 1998 legislation House Bill 1487 known as the "Level of Service" Bill, amended the Growth Management Act; Priority Programming for Highways; Statewide Transportation Planning, and Regional Planning Organizations. The combined amendments to these RCWs were provided to enhance the identification of, and coordinated planning for, "transportation facilities and services of statewide significance (TFSSS)" HB 1487 recognizes the importance of these transportation facilities from a state planning and programming perspective. It requires that local jurisdictions reflect these facilities and services within their comprehensive plan.

State-Owned Transportation Facilities

SR 167 provides the major link between the City of Pacific and the region. This limited access divided highway has interchanges at Ellingson Road and Stewart Road (8th Street East) to connect the city with the State highway system. It is the only state facility within the City limits.

Estimates of Traffic

Figure 7 provides 20-year traffic volumes for SR-167. The volumes were generated ~~by the Puget Sound Regional Council (PSRC) model~~applying ~~agrowth~~a growth rates to recent traffic counts.~~ which includes land use assumptions for 2025 for the City of Pacific~~.

Highways of statewide significance (HSS)

The Transportation Commission List of Highways of Statewide Significance includes SR 167 as an HSS within the City of Pacific and its growth area.

The City of Pacific affirms the establishment of LOS D as adopted by WSDOT for Highways of Statewide Significance.

Regionally Significant State Highways

In October 2003, the Puget Sound Regional Council Executive Board adopted level of service standards for regionally significant state highways in the central Puget Sound region. Regionally significant state highways are state transportation facilities that are not designated as being of statewide significance. The Regional Council took this action to comply with 1998 amendments (HB 1487) to the Growth Management Act.

Adoption of LOS standards for regionally significant state highways followed a year-long process involving WSDOT and the region's cities and counties. As part of the next major update to ~~Destination 2030~~Vision 2040, the Regional Council will develop additional performance measures, such as travel time, transit service levels, pedestrian, bicycle, etc.

Level of Service Standards

The PSRC 3-tiered approach to LOS is described below and illustrated in the attached PSRC map.

Tier 1
For this process, the "inner" urban area is generally defined as a 3-mile buffer around the most heavily traveled freeways (I-5, I-405, SR 167, SR 520, and I-90), plus all designated urban centers (most are located in the freeway buffer already). The proposed standard for Tier 1 routes is LOS E/mitigated, meaning that congestion should be mitigated (such as transit) when p.m. peak hour LOS falls below LOS E.

Tier 2
These routes serve the "outer" urban area - those outside the 3-mile buffer - and connect the "main" urban growth area (UGA) to the first set of "satellite" UGA's (e.g., SR 410 to Enumclaw). These urban and rural areas are generally farther from transit alternatives, have fewer alternative roadway routes, and locally adopted LOS standards in these areas are generally LOS D or better. The proposed standard for Tier 2 routes is LOS D.

Tier 3
Rural routes are regionally significant state routes in rural areas that are not in Tier 2. The proposed standard for rural routes is LOS C, consistent with the rural standard in effect for these routes once they leave the four counties in the PSRC region, such as SR 530 entering Skagit County.

The City of Pacific asserts that proposed improvements to state-owned facilities will be consistent with the Regional Transportation Plan (RTP) and the State Highway System Plan within Washington's Transportation Plan (WTP).

8. FINANCING AND IMPLEMENTATION

The State of Washington's Growth Management Act (GMA) requires that a jurisdiction's transportation plan contain a funding analysis of the transportation projects it recommends. The analysis should cover funding needs, funding resources, and it should include a multi-year financing plan. The purpose of this requirement is to insure that each jurisdiction's transportation plan is affordable and achievable. If a funding analysis reveals that a plan is not affordable or achievable, the plan must discuss how additional funds will be raised, or how land use assumptions will be reassessed.

Federal Revenue Sources

The 1991 federal Intermodal Surface Transportation Efficiency Act (ISTEA) reshaped transportation funding by integrating what had been a hodgepodge of mode- and category-specific programs into a more flexible system of multi-modal transportation financing. For highways, ISTEA combined the former four-part Federal Aid highway system (Interstate, Primary, Secondary, and Urban) into a two-part system consisting of the National Highway System (NHS) and the Interstate System. The National Highway System includes all roadways not functionally classified as local or rural minor collector. The Interstate System, while a component of the NHS, receives funding separate from the NHS funds.

~~In 1998, the Transportation Efficiently Act for the 21st Century (TEA-21) continued this integrated approach, although specific grants for operating subsidies for transit systems were reduced.~~

The "TEA" Funding programs continue to evolve. Federal Funds are now administered through the Puget Sound Regional Council (PSRC) and WSDOT. To receive ~~TEA21~~ Federal funds, cities must submit competing projects to their designated Regional Transportation Planning Organization (RTPO) or to the state DOT. Projects which best meet the specified criteria are most likely to receive funds. Projects which fund improvements for two or more transportation modes receive the highest priority for funding.

The status of ~~TEA~~ Federal funds ~~for 2004~~ is uncertain and pending federal approval on a two year cycle ~~as of this writing~~.

Projects Eligible for National Highway System Funding

- ~~Construction, reconstruction, resurfacing, restoration and rehabilitation and operational improvements to NHS segments~~
- ~~Construction and operation improvements to non-NHS highway and transit projects in the same corridor if the improvement will improve service to the NHS, and if non-NHS improvements are more cost-effective than improving the NHS segment.~~
- Safety improvements
- Transportation planning
- ~~Highway research and planning~~
- ~~Highway-related technology transfer~~
- Start-up funding for traffic management and control (up to two years)
- Fringe and corridor parking facilities
- Carpool and vanpool projects
- Bicycle transportation and pedestrian walkways
- Development and establishment of management systems

- Wetland mitigation efforts

Historical Transportation Revenue Sources

The City of Pacific historically has used three sources of funds for street improvements:

Income from Taxes

- Motor Vehicle Excise Tax (MVET)
- Motor Vehicle Fuel Tax (MVFT)

Income from Intergovernmental Sources:

- ~~HUD Block Grants~~
- Federal Aid (FAUS, FAS, ISTEA, etc.)
- Urban Arterial Board
- TIB and STP Grants

Miscellaneous Income:

- Interest Earnings
- Miscellaneous Income
- Developer Contributions
- ~~Transportation~~ Local Improvement Districts (LID)

In the past, motor vehicle excise tax (MVET) and motor vehicle fuel tax (MVFT) allocations from the state have been the major sources of continuing funding for transportation capital improvements. Initiative 695, passed by the voters in 1999, removed MVET as a significant funding source, so the MVFT ("gas tax") funding appear to be the only reliable source of transportation funds for the future. MVET and MVFT also provided funds for state and federal grants which are awarded competitively on a project-by-project basis and from developer contributions which are also usually targeted towards the developer's share of specific road improvements.

Capital Costs for Recommended Improvements

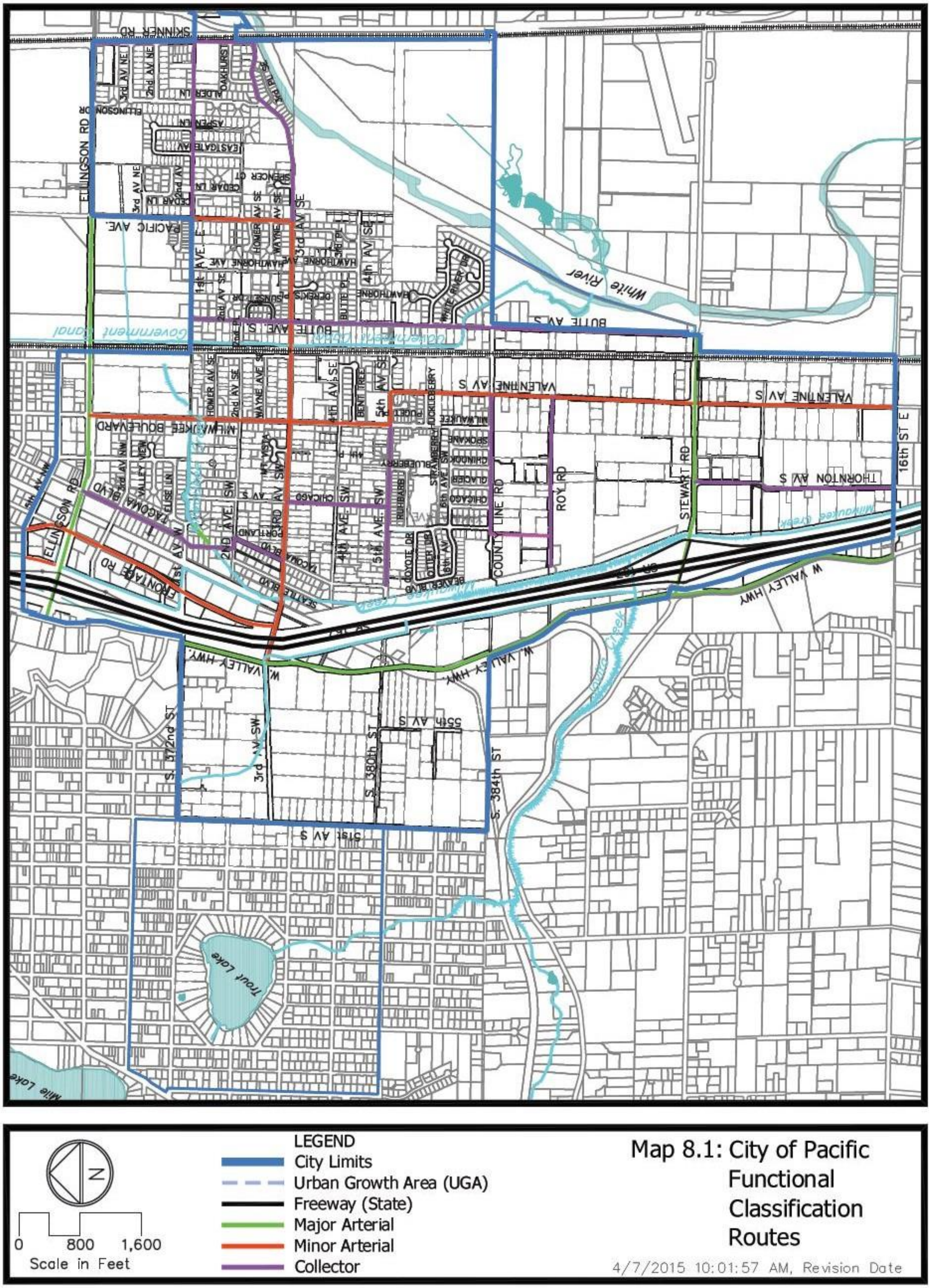
Based on the City's adopted 20-year land use plan, and the traffic analysis conducted on the city's roadway links, there are no capital improvements rquired in order to maintain the city's adopted LOS D for area roadways. Therefore, no capital cost information is presented within this plan.

However, safety enhancements, maintenance projects, corridor studies, and local intersection improvements *are* included in the City's TIP along with cost estimates and funding sources for each of those priortized projects. The City is required to annually update and adopt a 6-year TIP. A copy of the City's detailed TIP may be obtained from the Planning and Public Works Department.

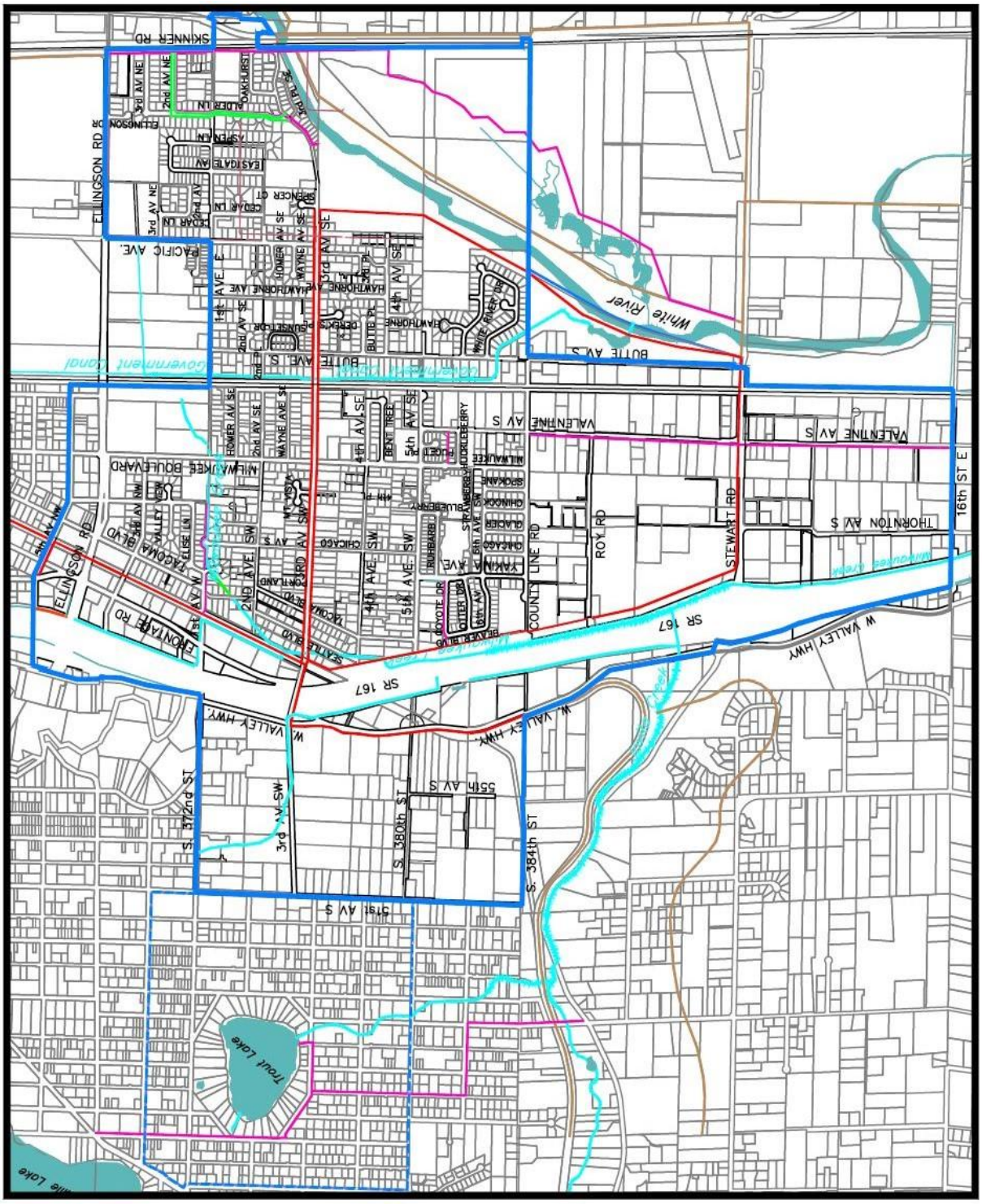
Alternative Sources of Transportation Funds

Transportation Benefit District
In 1987 the State Legislature created the option for local governments to form Transportation Benefit Districts (TBDs). A TBD is a quasi-municipal entity with the sole purpose of developing projects within the TBD boundary.

The TBD has a variety of options from vehicle tab fees to property taxes.



Map 8.1: City of Pacific Functional Classification Routes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BUTTE AVE S.
White River
Government Canal
VALENTINE AV S
16th ST E
THORNTON AV S
STEWART RD
ROY RD
COUNTY LINE RD
SR 167
W VALLEY HWY
MILWAUKEE BOULEVARD
TACOMA BLVD
SEATTLE BLVD
2ND AVE. SW
4th AVE. SW
5th AVE. SW
3rd AV SW
S. 372nd ST
S. 380th ST
S. 384th ST
55th AV S
31st AV S
Trout Lake
Mineral Creek


N
0 1,000 2,000
Scale in Feet
LEGEND
City Limits
Urban Growth Area (UGA)
Interurban Trail
Bike Lanes
Trail - General
Trail - Other Jurisdictions
Map 8.2: City of Pacific Trails
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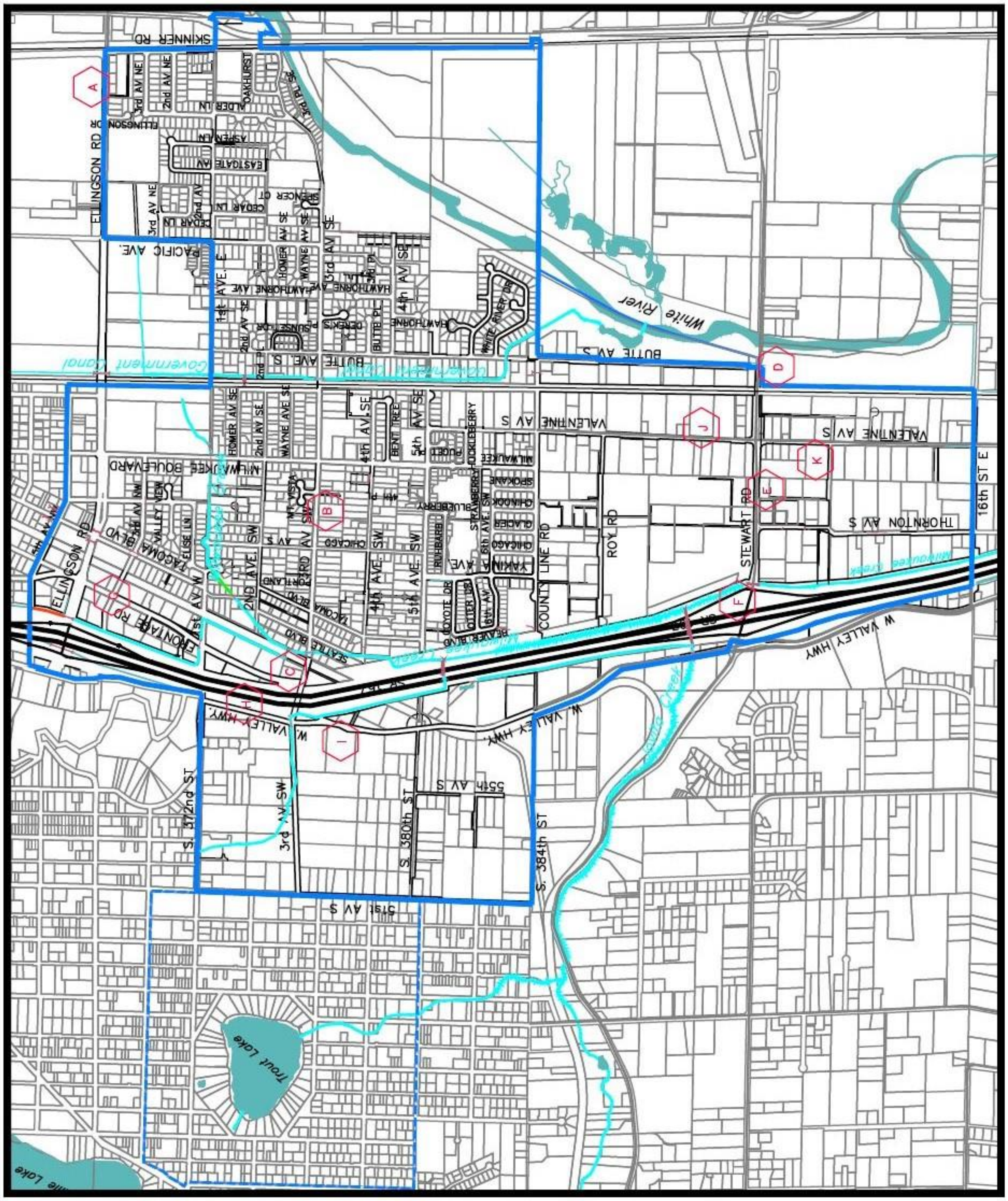

LEGEND
City Limits
Urban Growth Area (UGA)

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Scale in Feet

Map 8.3: City of Pacific Traffic Counts

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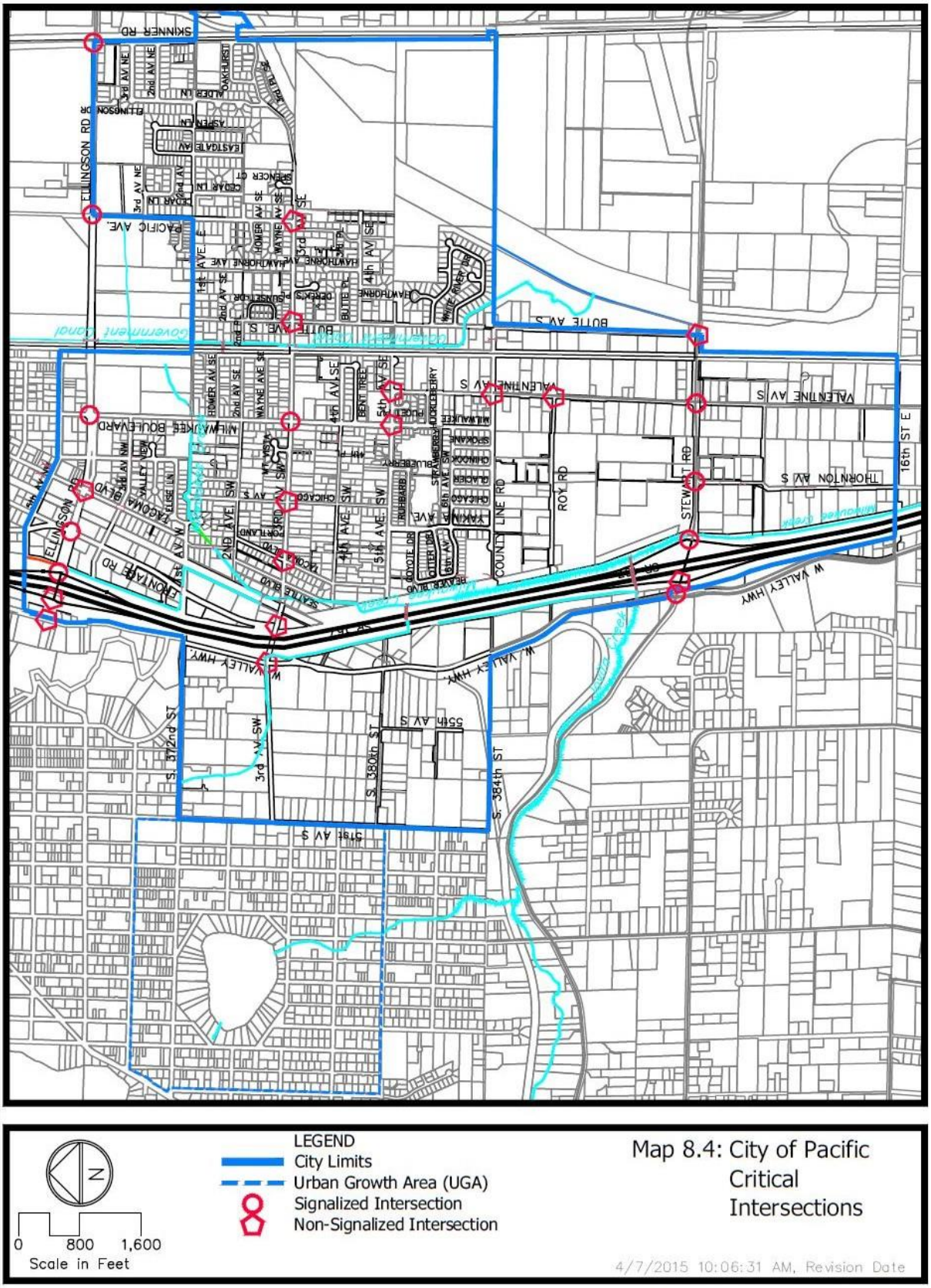
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City Limits
Urban Growth Area (UGA)
Signalized Intersection
Non-Signalized Intersection
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1,600
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Map 8.4: City of Pacific Critical Intersections
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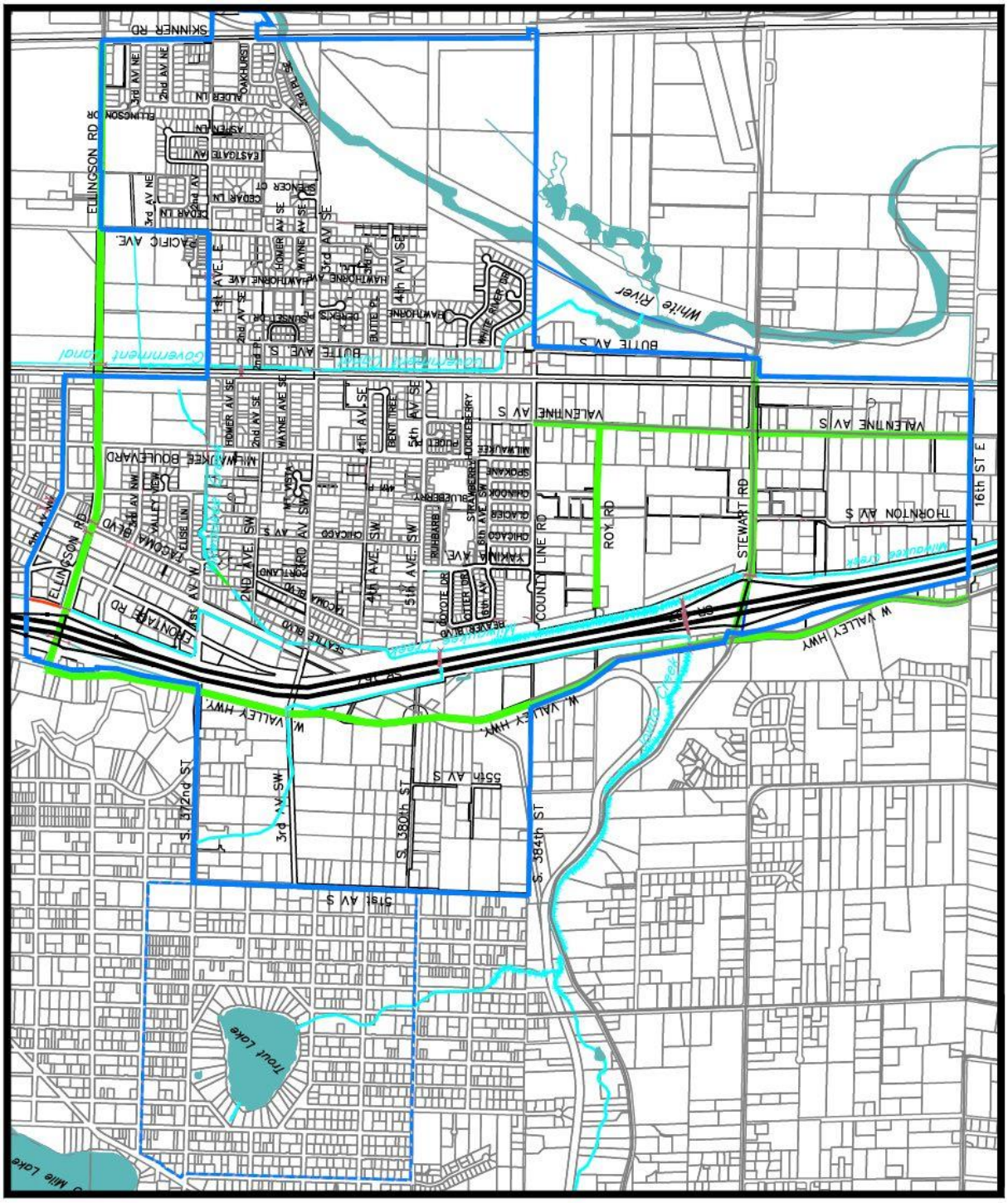
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PACIFIC AVE
BUTTE AV S
White River
VALENTINE AV S
16th ST E
THORNTON AV S
STEWART RD
ROY RD
COUNTY LINE RD
W VALLEY HWY
S 380th ST
S 384th ST
55th AV S
31st AV S
3rd AV SW
Trout Lake
LEGEND
City Limits
Urban Growth Area (UGA)
Recommended Truck Routes
N
0
800
1,600
Scale in Feet
Map 8.5: City of Pacific
Designated
Truck Routes
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City of Pacific
2015 Wetland Inventory

03/30/2015

Legend

- WETLANDS
- WATER BODIES
- CITY LIMITS

Disclaimer:
This map provides a generalized inventory of wetlands within the City and in most cases points to the need for further wetlands delineation studies prior to development. It does not imply that any particular parcel covered by a wetland designation is completely occupied by wetlands or is totally constrained from development.

N

0 100 200 Feet

Lower White River Biodiversity Management Area (BMA) Stewardship Plan

Pierce County Biodiversity Alliance

PCBA

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Regional Geographic Initiative Grant

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John Garner, Education Coordinator
Michele Cardinaux, *NatureMapping* facilitator

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Linda Burgess, Chair

Washington Biodiversity Council
Sarah Gage, Senior Project Associate
Lynn Helbrecht, Executive Coordinator

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Dave Seabrook, Board of Directors

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Jennifer Vanderhoof, Ecologist

Puyallup Tribe
Russ Landley, Fish Biologist

PCBA Coordinators
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Tracy Engels
Paul Houghtaling

Crescent Valley Alliance (CVA)
Lucinda Wingard, Founding member

Friends of the Lower White River (FLWR)
Jeanne Fancher, Founding member

Funding Sources

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Authors

Karen Dvornich, University of Washington
Linda Burgess, Puyallup River Watershed Council

Reference Citation

Dvornich, K.M., L. Burgess, 2009. Lower White River Biodiversity Management Area (BMA) Stewardship Plan: December, 2009. 122 pp.

Introduction

Biodiversity planning is a method used to identify land areas that provide for a biologically diverse representation of species. This planning method considers long-term ecosystem health and establishes a goal of maintaining adequate habitat to ensure the continued viability of a diversity of species within an ecoregion. Forest, riparian, and wetland habitats provide a full suite of ecosystem services vital to human health and livelihood besides a diversity of species.

Currently fish and wildlife planning methods consist of migratory routes and point locations of species of concern. What is missing is connecting the routes and points together that provide the necessary habitat to sustain all species, not just the rare and endangered ones.

The benefits of biodiversity planning:

- Protects remaining high-quality land cover important for fish and wildlife
- Implements Growth Management Act requirements for Habitat Conservation Areas
- Provides regional connectivity network for fish and wildlife dispersal and migration
- Establishes proactive approach to help avoid future listings under ESA
- Includes all habitat types not just point specific habitats such as wetlands, streams, endangered species locations

Pierce County's biodiversity planning efforts resulted in a Biodiversity Network consisting of 16 Biodiversity Management Areas (BMA). The BMA's are the "best of the best" within Pierce County. The Network is included in Pierce County's Comprehensive Plan Open Space Maps for fish and wildlife. Residents in each BMA automatically qualify for tax incentives.

In 2005 the Crescent Valley BMA was selected by the Pierce County Biodiversity Alliance (PCBA) as the pilot to implement long-term stewardship within the Network. As a result of a year-long effort working with the citizens, the Crescent Valley Stewardship Plan was developed and a community group formed, Crescent Valley Alliance (CVA) to undertake the action items identified in their plan.

The Lower White River Stewardship Plan was developed using Crescent Valley Stewardship Plan as a template. However, the Crescent Valley BMA falls within unincorporated Pierce County, while the Lower White River BMA lies between unincorporated King and Pierce County, Muckleshoot Tribe, and the cities of Auburn, Buckley, Pacific, and Sumner. Therefore this Plan, although designed as a non-regulatory document for local citizens, has been written to provide a thorough detailed report of what citizens and jurisdictions will need to do to protect, maintain and restore biodiversity over time.

Jurisdictions should be cognizant of the fact that much of the details and terminology may be familiar to them, but the goal of this Stewardship Plan is to be also used by the local citizens.. Furthermore, if each of the Stewardship Plans follows the same template, they can easily be merged into volumes representing the overall stewardship goals for the entire Biodiversity Network.

Table of Contents

Tables

Figures

Frequently Used Acronyms

APD – Agriculture Production District
BMA – Biodiversity Management Area
BWH – Backyard Wildlife Habitat
CLC – Cascade Land Conservancy
CVA – Crescent Valley Alliance
CWH – Community Wildlife Habitat
FLWR – Friends of the Lower White River
GIS – Geographic Information System
NWF – National Wildlife Federation
PCBA – Pierce County Biodiversity Alliance
PCCD – Pierce County Conservation District
PHS – Priority Habitats of Species
PSAT – Puget Sound Action Team
PWU – Pierce County Public Works and Utilities
RM – River Mile
SMA – Shoreline Master Act
SMP – Pierce County Shoreline Master Program
SMR – Pierce County Shoreline Management Regulations
SYH – Schoolyard Habitats
TNC – The Nature Conservancy
TPCHD – Tacoma Pierce County Health Department
URS – URS Consulting
WDFW – Washington Department of Fish and Wildlife
WSU – Washington State University – Pierce County Cooperative Extension Office

Chapter I - Background

Creation of a Biodiversity Plan for Pierce County

The Washington Growth Management Act requires each of the state's 39 counties and their cities to address open space and environmentally sensitive areas in their comprehensive plans. Pierce County's open space planning process includes land areas with the greatest fish and wildlife biological diversity or "biodiversity". The planning method used to identify these biodiversity areas is called "GAP analysis."

GAP analysis is a process of identifying core habitat areas that contain the highest level of species richness and representation remaining across the landscape. The GAP analysis methodology uses the mapping technologies of satellite imagery and the Geographical Information System (GIS) to create a current vegetation map. From that, distribution of wildlife species is derived and areas of high biodiversity are identified. The map is refined or "ground-truthed" with any and all known plant community and wildlife occurrences from WDFW's Priority Habitats and Species and Streamnet databases, the Department of Natural Resources' Heritage and Sensitive Plant Species databases, county natural resource inventories, and local expert biological opinion. This process identified core habitat areas that, along with a surrounding ¼ mile buffer area, provided the framework for the creation of biodiversity management areas (BMAs). BMAs were then connected, often along watercourses, and the resulting coverage became the Biodiversity Network. This information was subsequently incorporated into Pierce County's Comprehensive Plan Open Space Corridors Map.

In January 2000, the first Biodiversity Plan for Pierce County was published[1]. The habitat types represented in the Pierce County Biodiversity Network include lowland riparian areas and wetlands, deciduous hardwoods, oak savannahs and prairies, deciduous old-growth forests, and alpine peaks and meadows. Many of these habitats contain imperiled species including Chinook Salmon, Western Gray Squirrel, Bald Eagle, Spotted Owl, Grizzly Bear, Gray Wolf, and Western Pond Turtle. In addition, the Pierce County GAP analysis was conducted using watershed boundaries, rather than jurisdictional boundaries; therefore the Pierce County Biodiversity Network extends into the adjacent counties of King, Kitsap, Thurston, Lewis and Yakima.

In 2003, Pierce County began a finer-level assessment of lands within the Biodiversity Network to provide a groundtruthing of the original network. This assessment included detailed review of each BMA and connecting corridors through the use of recent orthophotography and site visits conducted by a WDFW biologist. The predicted species lists were also updated to add all predicted species including butterflies, introduced species, and known salmonid presence. The result of this assessment was unilateral removal of the ¼ mile buffer placed around the core habitat polygons, re-alignment of all the connecting corridors along watercourses, and a decision to refine the boundaries of each of biologically rich areas to ensure property lines were not bisected and habitats necessary for the long-term survival of the species based on local watersheds were included. The final revised Biodiversity Network identifies 16 biologically rich areas and connecting corridors that cover 267,784 acres of land (see Figure 1 – County's Revised BMA network) and 41 percent of the salmonid-bearing streams (see Figure 2 – Salmonids). In 2004, the County Council adopted the Pierce County Biodiversity Network Assessment Report[2], and modified the County's Comprehensive Plan Open Space Corridors Map to reflect this revised data set.

[1] Pierce County GAP Application Pilot Project: A Biodiversity Plan for Pierce County, Washington, January 2000.
[2] Pierce County Biodiversity Network Assessment, August 2004.

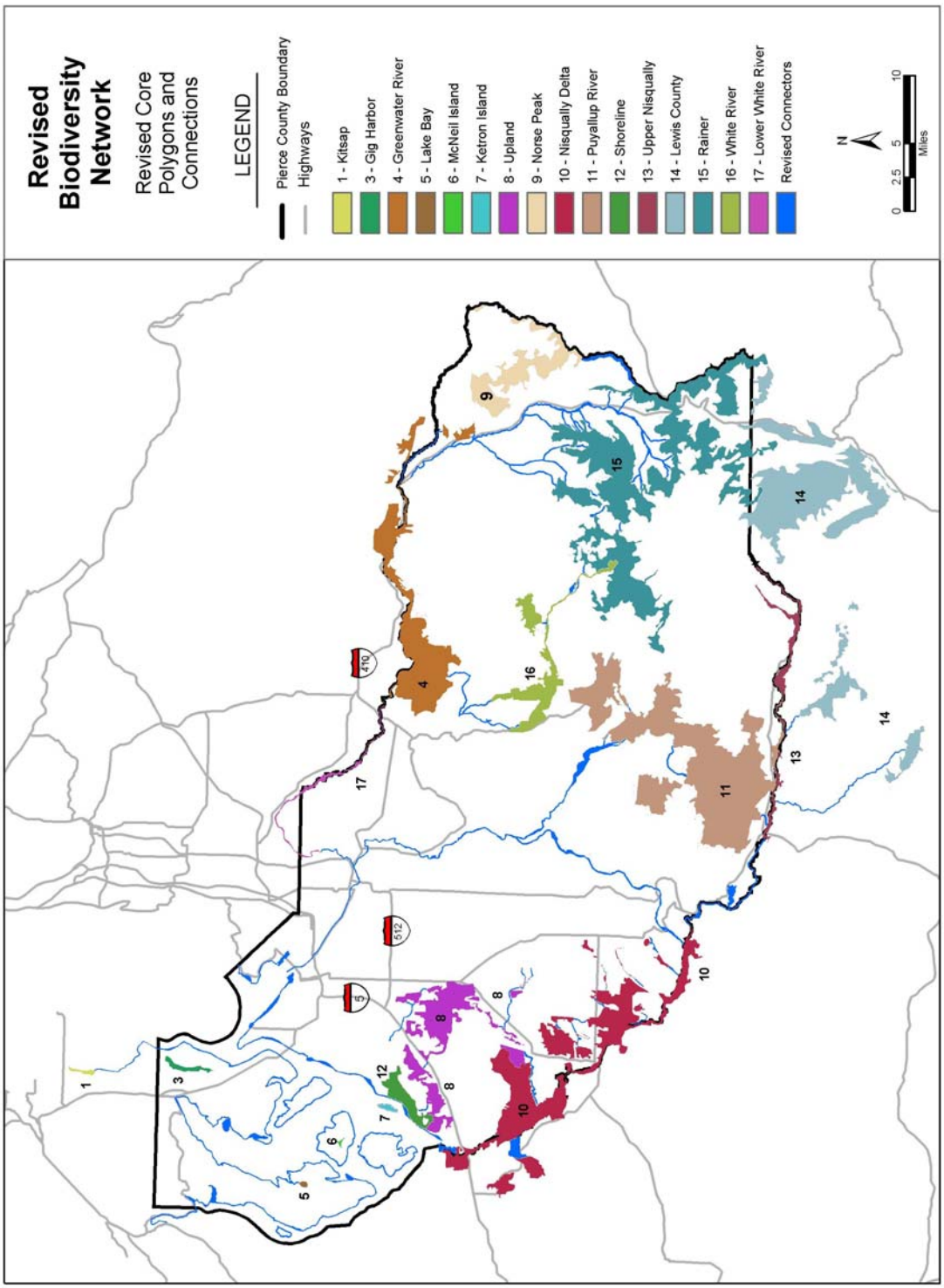


Figure 1. Revised BMA network

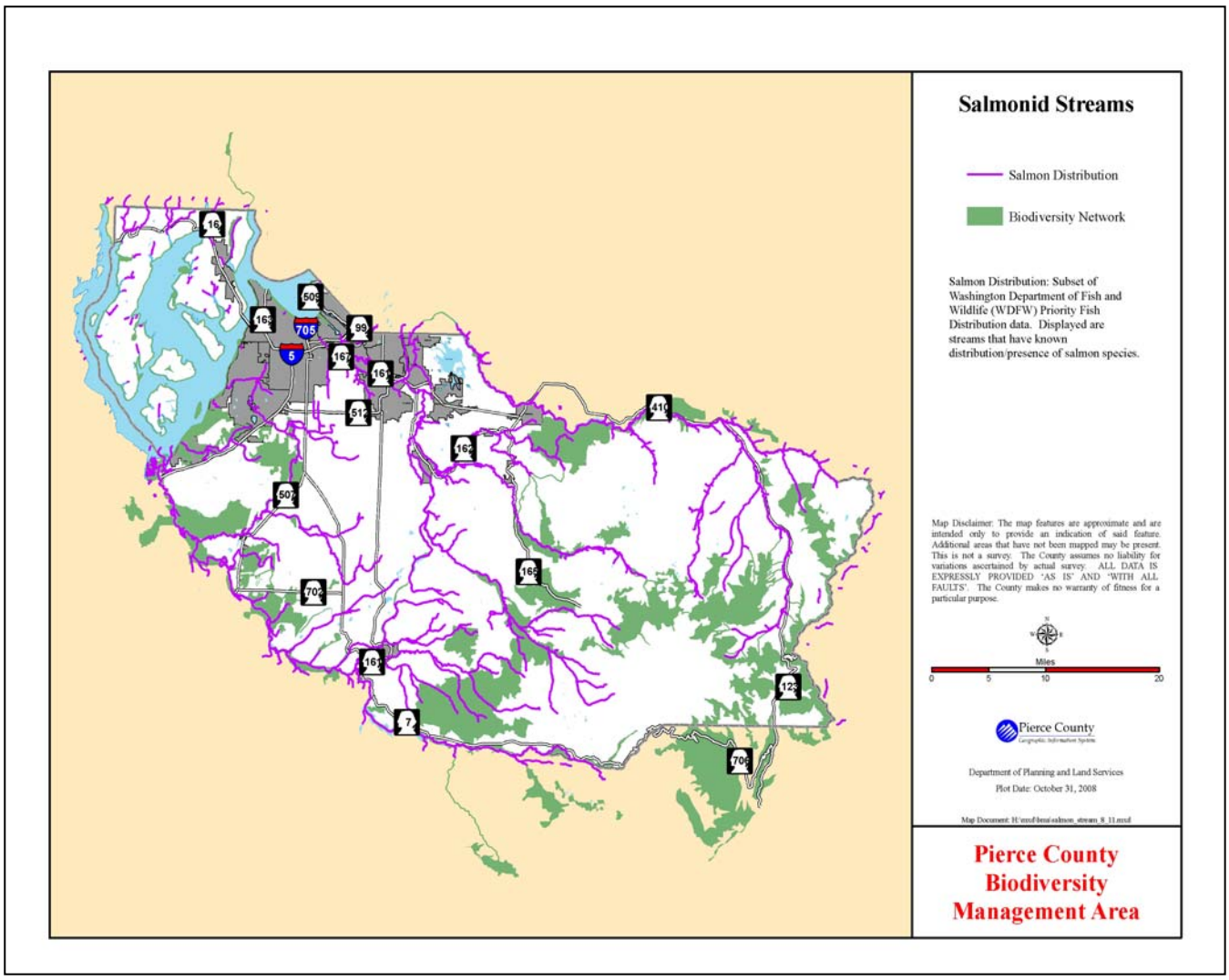


Figure 2. Salmonid presence

Implementation Strategies for the Biodiversity Network at a County and City Level

Since adoption of the first Pierce County Biodiversity Plan, the County has been using this biodiversity information in relation to land use planning in a variety of ways. The Biodiversity Network coverage has been integrated into the County's Comprehensive Plan Open Space Corridors map. This map has been considered in many community planning processes and within those plans has served as the basis for the creation of lower density zones and the establishment of habitat conservation based design standards, such as **low impact** development techniques and minimum native vegetation retention. In addition, Pierce County regulations have been changed to recognize lands within the Biodiversity Network as a high priority for various incentive programs such as the Conservation Futures Program and Current Use Assessment Program.

Because the Biodiversity Network was created using watershed rather than political boundaries, King, King, Kitsap, Mason, Thurston, Lewis, and Yakima counties are being notified of the Network and of opportunities to work together for the protection of biodiversity. To date, King and Pierce County Executives have signed a declaration authorizing cooperation on significant, shared boundary natural resources, including the Lower White River. King County Water and Land Resources Division has provided information inserted within this report and at the end as a separate chapter.

This multi-pronged implementation strategy is putting emphasis on proactive conservation of multiple species, rather than on reactive restoration of individual threatened or endangered species. This approach helps guide county and city planners in directing more intense development away from identified bio-rich lands and can also guide private and public land conservation purchases or easements and restoration actions.

However, while some progress has been made at a countywide planning level, landscape scale planning documents often fail to implement on-the-ground land use actions that serve to promote long-term conservation in "bio-rich" areas. Thus, the ultimate strategy for implementation is to work directly within each BMA to conduct detailed inventories of the predicted species and habitat; re-evaluate the BMA boundaries at a local watershed scale making sure not to bisect property lines or missing critical features not obvious at the countywide scale the BMA was created; meet with local jurisdictions and property owners to ascertain potential stresses to the system and sources of stress (collectively referred to as "threats") and identify a set of conservation strategies to abate these threats; and develop a set of prioritized actions to reduce or eliminate threats and restore habitat areas that will be implemented by a community group or individual landowners over time.

Pierce County Biodiversity Alliance

In order to accomplish the preservation of biodiversity within Pierce County's Biodiversity Network, a group of dedicated individuals has formed an alliance (referred to as the Pierce County Biodiversity Alliance). The Pierce County Biodiversity Alliance (PCBA) is comprised of a unique set of stakeholders, representing governmental, academic and non-profit agencies, who are interested in preserving the long-term biodiversity of Pierce County. Alliance members include Pierce County government; University of Washington - Cooperative Fish and Wildlife Unit; *NatureMapping* Program; NatureMapping Foundation; Washington Department of Fish and Wildlife; Metro Parks Tacoma; Tahoma Audubon Society; Friends of Pierce County; Pierce County Conservation District; Point Defiance Zoological Society; U.S.G.S. – National GAP Program, University of Puget Sound, National Wildlife Federation, Puyallup River Watershed Council; and The Cascade Land Conservancy. And the PCBA is continuing to expand and partner with others who are also interested in protecting biodiversity within the Pierce County

Biodiversity Network, including neighboring cities/counties that fall within the Network.

The main emphasis of the PCBA is non-regulatory in nature and instead focuses on public outreach to property owners within the Pierce County Biodiversity Network, providing education and incentive programs to maintain the habitats and biological diversity. The PCBA goal is to establish biological surveys and monitoring programs and facilitate the development of locally derived habitat conservation plans that will provide detailed information on habitat quality and species presence/viability, identification of threats, threat abatement strategies including restoration opportunities, and priorities for conservation and land acquisition for each BMA. And during this process, create a cohesive community group that can work together towards long-term implementation of conservation strategies.

This endeavor advocates responsible land use and success will be achieved when each BMA and connecting corridor retains ecological function given the community's land-use objectives as outlined in their adopted County or City Comprehensive Plan or in their community plan. Any Biodiversity Stewardship Plans adopted by Pierce County are considered a supporting plan to the Comprehensive Plan.

Project Description and Public Participation

The Lower White River BMA is a Puget Sound lowland environment that includes the local jurisdictions Buckley, Auburn, Pacific, and Sumner on the Pierce-King county border. The White River joins the Puyallup River in Sumner, and flows into Puget Sound at Commencement Bay in Tacoma. The BMA covers 1,593.27 acres/2.49 square miles of which 941.39 acres/1.47 square miles are within Pierce County. Ten miles of the Lower White River[3] (River Miles [RM] 14 to 24) are within the BMA. The river supports several documented salmonid species including Chinook (Federally Threatened, State Candidate), Chum, Coho, Pink, and Steelhead. In particular, the White River Spring Chinook population is considered a priority population in Puget Sound.

On April 29th 2006 a public tour of three sites within the Lower White River (see Figure 3) was hosted by the Puyallup River Watershed Council to begin publicizing the biological importance of the Lower White River. In June 2006, the PCBA conducted an intensive 24-hour species verification survey (referred to as a "bioblitz") and community outreach efforts on private lands within the Lower White River BMA. Three sets of teams covered three areas: Buckley, lands east of the Muckleshoot tribal lands, and Auburn/Pacific. The Washington Biodiversity Council[4] selected the PCBA's work beginning in the Lower White River BMA as one of their two pilot projects and provided funding for the bioblitz. An EPA grant funded the April, 2007 12-hour bioblitz in 3 areas in Auburn and Pacific not adequately sampled in 2006: City of Pacific's Riverside Park, City of Auburn's Game Farm, and Pierce County Water Program's property. Many of the volunteers that were trained for the first bioblitz held in 2005 in the Crescent Valley BMA were the leaders for the 2006 Lower White River bioblitz. These volunteers were trained at a *NatureMapping* workshop on data collection protocols[5]. Additional *NatureMapping* workshops in 2007 were conducted in preparation for the 2007 bioblitz.There were direct mailings to all property owners within the BMA for each of the three above mentioned events (see Figures 3-5) and follow-up telephone contacts. The events also received media coverage through the Tacoma News Tribune, Auburn Reporter,

[3] The sections of the Lower White River that did not qualify as a BMA were designated as a connecting corridor.

[4] The Washington Biodiversity Council's website http://washington.biodiversity.council.gov

[5] The *NatureMapping* Program trains teachers and individual citizens to conduct wildlife and habitat assessments, using standardized protocols and methodology, for integration into a statewide biological survey. All information is transmitted to a central database repository, located at the University of Washington, where it can be used by the public to make local policy and planning decisions regarding how resources may be managed. Website: http://depts.washington.edu/natmap

Courier-Herald, and a Rainier Cable broadcast on the local government channel. Beginning in the afternoon of June 2, 2006 bioblitz participants, lead by a Department of Fish and Wildlife staff biologist, utilized the *NatureMapping* Program's NatureTracker data collection and global positioning software to precisely identify where birds, mammals, amphibians, reptiles, insects, aquatic insects, and plants were found and accurately document what species was identified. The Marion Grange on Old Buckley Hwy served as science central headquarters in 2006 and the Auburn Game Farm was science central in 2007. [Five private landowners allowed access to their private property in 2006.] A total of 80 volunteers including taxonomic experts, 5 high school students, and 10 landowners in 2006 and 39 volunteers in 2007 observed 84% of the predicted bird species, 88% of the predicted amphibians, 52% of the predicted mammals, 60% of the predicted reptiles, 5 fish species, 207 invertebrate samples, and 276 plant species.

The information gathered from the field surveys established a benchmark of current species located within the Lower White River BMA and will also contribute to long-term monitoring activity. Species observations recorded during this monitoring will be used to evaluate whether biodiversity conservation strategies are having positive and successful results. Landowners may also use this information when enrolling in Pierce County's Current Use Assessment tax incentive program or making application for a land acquisition using Conservation Futures funding.

The Puyallup River Watershed Council and Pierce County Biodiversity Alliance (PCBA) invite you to learn from the experts about the dynamics of the Lower White River Corridor watershed. Come view the White River as it meanders through hardwood forests home to eagle, osprey, and bear. View elk wintering grounds, amphibian breeding ponds, and more. Learn how responsible land use decisions can combat the threats to biodiversity and retain ecological function while achieving a community's land use objectives. Learn about opportunities for volunteer tax-reduction programs.

1. Site 1: Auburn Game Farm Park – Encompasses ~72 acres of park and open space along the White River, the park is a unique mix of untapped wildlands within an urbanized environment. After an introduction to biodiversity by Michelle Tirhi, state wildlife biologist and PCBA member, we'll search for many species of birds, fish and wildlife. Aaron Nix, Environmental Protection Mgr with the City of Auburn, will discuss Auburn's comprehensive environmental plan and explain his role in helping keep these types of places special in Auburn.

2. Site 2: River Trail Walks – Don Johnson, a private landowner in the Lower White River, will lead a wildlife walk down the river trail where we will seek out beaver, elk beds, and other elk sign. Michelle Tirhi will talk about the upcoming BioBlitz on June 2nd and 3rd where landowners can become biologists for the day participating in frog trapping to eagle nest counts.

Site 3: Wetlands Complex – This is an area where red-legged frogs and wetland dependent birds, especially several species of flycatchers nest. Tony Fuchs, staff biologist from Puget Sound Energy (PSE), will discuss the dynamics of the wetland complex, including the water regime, beaver modifications, and habitats. Chip Nevins, Conservation Director for Cascade Land Conservancy, will talk about plans to acquire a 10 mile stretch (~3,000 acres) of undeveloped PSE-owned land straddling both sides of the White River to preserve it for future generations.

Vans depart from Auburn Game Farm Wilderness Park
Saturday, April 29th 1-4 PM
RSVP required to reserve your seat on the van
Phone 253-863-1860 or ltburgess3@msn.com

Figure 3. Mailing Notice for April 29th Preview Tour in Lower White River BMA

Dear Lower White River Resident:

As a resident of the Lower White River, you know that it's a special place filled with natural beauty and wildlife. This area was recently recognized as a unique place that sustains healthy populations of fish, mammals, birds, reptiles, and amphibians. Pierce County Biodiversity Alliance (PCBA) needs **YOUR** help to better understand the wildlife that lives in the Lower White River watershed.

As a land owner in the Lower White River, you may qualify for a property-tax reduction while you help Washington wildlife. By granting access for a one-day wildlife inventory in the Lower White River watershed, you could become eligible for your county's open-space tax-reduction program. If wildlife were found on your property, a wildlife assessment would increase your tax break and add points to your application. Join Fish and Wildlife biologists and volunteers for a day of fun as they create wildlife assessments of the area.

Pierce County Biodiversity Alliance, in cooperation with the University of Washington, Washington Department of Fish and Wildlife, Metro Parks Tacoma, Puyallup River Watershed Council, Friends of Pierce County, Pierce County Conservation District, Point Defiance Zoological Society, U.S.G.S. National GAP Program, and National Wildlife Federation, will be conducting a wildlife inventory known as a "**Bioblitz" from 3:00 p.m. Friday, June 2nd through 3:00 p.m. Saturday, June 3rd.** We are asking you and other property owners for your participation to help make this event a success.

Please note: This inventory is intended for scientific information gathering purposes only and landowners participating in the Bioblitz are under no further obligation or restriction to land-use on their property. The inventory will involve a visual tally of observed wildlife and every effort will be made to avoid impacting any natural or man-made features on the property. Everyone participating in this event is insured, so there is no liability to property owners. Landowners are encouraged but not required to accompany biologists during the inventory.

To participate in the **Bioblitz** of the Lower White River, or if you have questions, please complete the attached form or respond to Michelle Tirhi by email at tirhimjt@dfw.wa.gov or by telephone at 253-813-8906.

Michelle Tirhi
Pierce County Biodiversity Alliance
25644 44th Ave. S.
Kent, WA 98032

Figure 4. Mailing Notice for June 2006 Bioblitz Event in Lower White River BMA

Greetings:

Please join the Pierce County Biodiversity Alliance for BioBlitz 2007: Lower White River – Part 2. Many of you participated in last year's BioBlitz. It was a very fun event and quite successful in terms of wildlife and habitat inventory. An overview is provided at: http://depts.washington.edu/natmap/pierce_county.html.

Formally designated the Lower White River Biodiversity Management Area (BMA), this region is an incredible mix of habitat. Dominated by riparian hardwood, the habitat also includes abundant wetlands, flood channels, seeps, and grasslands. Because of the size of the survey area, there is a need for several BioBlitz events.

This year's BioBlitz will focus on filling in the gaps from last year's event. We will be surveying sites that are more urban, but still important to the wildlife that live there. Additionally, we will be targeting several species that we believe should be found in the BMA but were not recorded during last year's survey. The BioBlitz will occur on Saturday, April 21 from 6:00am to 6:00pm. Team leads will do some additional surveys before and after. Taxa that will be surveyed include: mammal, bird, amphibian, reptile, invertebrate, fish, and plant.

Also this year, in conjunction with the survey work, we will host a special event commemorating Earth Day which will highlight the biological diversity of the Lower White River area. We will be inviting the public and members of the media to Science Central for the latter part of the day to heighten their awareness of the natural world and offer ways to help support biodiversity in their own backyard.

So, the 2007 BioBlitz has three objectives. First, to continue to validate the species predicted to inhabit the area based on modeling conducted as part of our larger Pierce County Biodiversity Network Project. Second, to engage community members in discovering the biological richness of the region. Third, to have a great field day for all participants in one of Western Washington's most scenic areas.

This is an intensive event and our team participants work hard documenting as many species as possible against the clock. The members of the Pierce County Biodiversity Alliance and Puyallup River Watershed Council thank you in advance for your assistance. What a great way to do something meaningful for Earth Day! Please indicate your interest by filling out the attached Participation form and sending it to me as soon as possible. Please contact me if you need additional information. Thank you!

Michele Cardinaux
BioBlitz 2007 Coordinator
1919 S. Tyler Street
Tacoma, WA 98405
(253) 591-6439
michele@tacomaparks.com

Pierce County Biodiversity Alliance (PCBA)

Dedicated to conserving the biodiversity of Pierce County, Washington

Figure 5. Mailing Notice for April 2007 Bioblitz Event in Lower White River BMA

A community meeting was held in November 8, 2006 to present the results of the June bioblitz to the residents in the Lower White River BMA and solicit their help developing long-term biodiversity

conservation strategies for this area. The PCBA led a total of four community meetings over four months using the same approach to develop community stewardship plans. However, bad weather and flooding reduced public attendance. Those that did attend were personnel representing multiple jurisdictions within the BMA and didn't need to be educated about conservation planning and terminology. It was decided that the meetings should be postponed until a draft plan was developed and presented to the jurisdictions. The meeting agendas and meeting summaries are attached as Appendix 1.

Implementation of the Lower White River BMA Stewardship Plan

The Lower White River BMA Stewardship planning process includes the development of implementation measures to conserve biodiversity within each jurisdiction included in the BMA. These measures include actions such as property owner enrollment in county tax reduction incentive programs (Current Use Assessment - Public Benefits Rating System) or permanent dedication or purchase of properties as open space (Conservation Futures Program); restoration of native vegetation in areas of degraded habitat (Landowner Incentive Programs, Washington Department of Fish and Wildlife's and National Wildlife Federation's Backyard Wildlife Sanctuary Programs, Pierce County Conservation District's Stream Team); and education on acceptable riparian/wetland land management. Because local jurisdictions may have additional implementation measures that can be applied to their local communities, Chapter VII lists these measures. Chapter VII also customizes proposed action steps for community review.

It should be noted that the Lower White River is not a separate "entity", but part of the Biodiversity Network continuum between the White River BMA, and the Puget Sound via the Puyallup River. The cities of Sumner and Buckley fall within the Lower White River BMA and along the connectors. Therefore, their stewardship efforts extend into the Network.

As stated above, the PCBA's goal is to create a cohesive network of community groups that can work together towards long-term implementation of conservation strategies outlined in the Stewardship Plan. One group that has formed is the Friends of the Lower White River (FLWR) that will be pursuing funding opportunities to complete action items. To that end the FLWR adopted the following Mission Statement:

> *Our mission is to protect the biodiversity and health of the Lower White River Basin and its communities through education; supporting scientific research; fostering citizen participation in government; and by buying, and holding in trust for the public good, critical areas, aquatic and riparian wildlife habitats, and other lands of ecological significance.*

One easy to implement action within the stewardship plan is the certification of individual backyard wildlife habitats individually through the Washington Department of Fish and Wildlife and/or the National Wildlife Federation, or as a community certification with the National Wildlife Federation. The Crescent Valley Alliance was formed by local citizens that helped create their Biodiversity Stewardship Plan as part of the PCBA's Gig Harbor/Crescent Valley BMA implementation pilot project. The Alliance listed the creation of 50 certified backyard habitats as one of their short-term stewardship action plans and as a community became registered for the National Wildlife Federation's Community Habitat Program in 2008.

National Wildlife Federation - Community Wildlife Habitat Program Certification

National Wildlife Federation's (NWF) community education programs empower homeowners, students, community leaders and businesses to preserve, restore and create sustainable landscapes that support a multitude of wildlife and native plants in their backyards, workplaces, places of learning and other community spaces. NWF supports these efforts through training, print and online resources and recognition through a formal certification process. To certify a habitat through NWF, individuals must provide local wildlife with four basic elements: food, water, cover and places for wildlife to raise their young. To date there are 2,325 certified Backyard Wildlife Habitat (BWH) sites, 50 Schoolyard Habitats (SYH) sites and two certified Community Wildlife Habitats (CWH) in Washington State.

The Community Wildlife Habitat program is critical to NWF's work in the Puget Sound as it takes the basic elements of the BWH program from the individual backyard to multiple locations throughout a community. Once a community is engaged and interested in taking action to promote healthy habitat, they form a habitat team and, with guidance from NWF staff, set achievable goals that reflect the size and needs of the community; at which point they become formally registered as a Community Wildlife Habitat site. The CWH certification system is points-based and each community earns a certain amount of points that fall within five categories (Registration, Habitat Certification, Education, Community Projects and Administrative Goals).

On average, communities spend three to five years completing their certification goals during which time a certain number of residences, schools and businesses become certified backyard, schoolyard and workplace habitats. Community groups also design and implement an array of locally relevant, habitat-related projects within their communities. Projects include (but are not limited to): stream cleanups, invasive plant removal and native habitat restoration, plant and wildlife rescue, after-school ecology programs, the creation of educational outreach materials and community-sponsored events such as the Tukwila Backyard Wildlife Fair and the Lake Forest Park Dig It! Green Fair. Currently Tukwila and Camano Island are certified and the communities of Alki, Lake Forest Park, Bellingham and Anacortes are registered and working toward their certification goals.

The Crescent Valley Alliance founding members have certified backyard habitats. Their efforts to convince more residents within the BMA to certify their yards and join their efforts as a registered Community Wildlife Habitat site have three key components. The first is on an emotional level:

> *"It causes us to hold ourselves accountable for what we do, and it's created a very emotional, meaningful connection to our land. There is a sense of accomplishment and a feeling that we have done something good for the world and for our kids." ...And that, Lucinda Wingard says, is worth the effort.*

The second component is educational. Residents within the BMA signing up for backyard habitat certification through the Crescent Valley Alliance are learning the Biodiversity Stewardship Plan and how they can play a role as stewards. The third component is financial. BMA residents learn about the financial incentives available to them. Some residents have received up to 25% reduction on their property taxes.

Chapter II - Lower White River BMA Overview

General Description of Lower White River BMA

The Lower White River BMA is located along the White River west of the Greenwater River BMA and is approximately 1,593 acres in size. This BMA is located within the Puget Trough ecoregion[6] (Region 7) and the Puget Sound Douglas-fir vegetation zone (Zone 31). The primary driver habitat for this BMA is riparian habitat (code 533) dominated by hardwood trees and small shrubs. The entire BMA is located within the Puyallup-White River Watershed WRIA 10 (Watershed Resource Inventory Area). Figure 6 depicts the BMA boundary overlain on ortho-photography mapping of the surrounding area.

Figure 6. Lower White River BMA

The White River demarcates King County's southern geo-political boundary. Multiple jurisdictions are present in the BMA in King County including the cities of Auburn, Pacific, and Enumclaw and the Muckleshoot Indian Tribe. King County owns some lands within those other jurisdictions. Additionally, the portion of the BMA that stretches from the Muckleshoot Reservation east to the terminus of the Lower White River BMA is all unincorporated King County. The actual area covered by the BMA that lies within the jurisdiction of unincorporated King County is very limited

[6] Washington Gap Analysis Project Volume 1 – Landcover of Washington State defines ecoregions as contiguous geographic areas of similar climate and geologic history and vegetation zones as areas in which moisture, temperature, and other environmental parameters combine to create conditions that favor similar vegetation communities. 1997.

The White River Basin Plan Characterization Report[7] contains the following general description of the physical and biological characteristics of the watershed basin, which also provides a good representation of the Lower White River, as follows:

> The *White River Basin is divided into 10 sub-basins. The Lower White Sub-basin was established based on the transition from the Cascade foothills to the Puget Sound Lowlands. This sub-basin drains 52 square miles of the plateau formed by the Osceola mudflow and landforms associated with the last glacial advance in the region. The White River flows for 22.5 miles in the sub-basin, dropping in altitude from 620 to 39 feet at the confluence with the Puyallup River. Flooding in the Lower White River Basin is a natural phenomenon that has been mitigated by means of engineered structures (dams and levees). The river flows unconstrained until it reaches Mud Mountain Dam at RM 29.6. The dam, which began operation in 1948, is operated by the U.S. Corps of Engineers to control flooding in the lower Puyallup floodplain. (The Corps of Engineers co-located the Mud Mountain Dam fish passage facility which is a trap and haul program at the Puget Sound Energy (PSE) Diversion Dam. This facility consists of a fish trap, fish ladder and truck transfer facility to load and haul upstream migrants. The transfer process involves trucking the fish to a release point 10 miles upstream and 4 miles above Mud Mountain dam.)*
>
> *Pierce County maintains a system of flood control levees along the White River. According to the 2005 Capital Improvement Program (CIP), prepared by Surface Water Management, only 6 percent (1,840 of 29,209 linear feet of levee) on the White River levee system currently provides 100-year flood protection. There are 4,551 acres in 100-year flood zone and an additional 459 acres in the 500-year flood zone. Specific areas with flooding issues include the Red Creek area just downstream of the dam, Muckleshoot Tribe fish hatchery, Buckley Meadows subdivision, Sumner golf course, residences near the intersection of 8th Street and 138th Avenue East and the Sumner sewage treatment plant.*
>
> *Before 1906, the White River flowed north from Auburn to join the Green River and ultimately discharged into Seattle's Elliott Bay. In 1906, a debris jam blocked the channel of the White River and diverted all the floodwaters away from King County down the Stuck River and south into the Puyallup River. The debris dam was replaced by a permanent diversion wall located at the game farm park in Auburn.*
>
> *Stream flow in the White River is affected by the Lake Tapps diversion near Buckley. Diverted water is stored in Lake Tapps and eventually returned to the White River via the Deiringer Canal. Lake Tapps was built to create storage for the PSE White River hydroelectric project, which came on line in 1912 and suspended operations in January 2004. Approximately 2.5 miles of earthen dikes and embankments were built around four small natural lakes to create the current Lake Tapps. The dikes are maintained to control flooding. A diversion dam on the White River at RM 24.3 is used to fill the lake. Flooding in November 2006 damaged the structure and spawning salmon had difficulty using the adjacent fish ladder in the fall of 2007. Spawning salmon are trapped at the fish ladder and trucked approximately 5 miles upstream of Mud Mountain Dam.*

Significant native riparian vegetation exists within the Lower White River riparian corridor despite continued development encroaching from western Pierce and King Counties. The river running through Sumner, Pacific, and Auburn has been channelized in many locations. The cities of Sumner, Auburn, and

7 "Draft White River Basin Plan" Pierce County Public Works and Utilities Department – Surface Water Management Division, September, 2007.

Buckley are partially located within the floodplain of the river. The floodplain width is variable, ranging from less than 100 to 1,000 feet. The bankfull width e.g. maximum width the stream attains and is typically marked by a change in vegetation or other geological features) ranges from 80 to 500 feet, but the bankfull depth is more consistent and averages 5.5 feet throughout the river. Flood control levees on the White River extend upstream to RM 11.5 but are maintained only to RM 9.4. Segments of the White River have been identified by the Puyallup Tribe as Critical Fishery Rivers and Streams (Pierce County Critical Areas- Type F1: Title 18E40.060B), mandating 150-foot buffers.

When the boundary lines were drawn around the Lower White River BMA, the current river channel was included, but much of the riparian area (including the floodplain) was not. However, that was an oversight due to scale of the original GAP polygons, and the BMA should be changed to include riparian areas, including at a minimum, the entire floodplain.

From an ecological standpoint, the river cannot be separated from its floodplain. These areas are tightly interconnected, and these connections contribute to biodiversity. The floodplain contains substantial physical diversity, including a mosaic of semi-aquatic habitats, complex micro-topography, and patchy concentrations of moisture and nutrients. The physical diversity of the floodplain is supported by riverine processes such as periodic flooding, channel migration, and sediment deposition. Similarly, the floodplain contributes to the diversity of the river by providing wood and sediment to the channel. These are the raw materials for building instream habitats, and for creating new floodplains. The physical diversity that results from these interactions supports high levels of species diversity in the river, as well as in the floodplain. For example, where the river is rich with wood from the floodplain, the channels are split into multiple threads with abundant cover, pools, edges, and gravels that support diverse communities of fish and insects. Where the floodplain is connected to the river, there is abundant habitat for raptors, songbirds, shorebirds, and waterfowl, as well as small and large mammals and reptiles and amphibians. Floodplains also support high levels of plant diversity, owing to the variable patterns of moisture and resources, and wide distribution of protected refuges. In addition, riparian areas contribute substantially to biodiversity by providing habitat for plants and animals that are not commonly found in uplands.

The Lower White River BMA is narrow and in fact does not fully occupy the extent of the historic floodplain in which it lies. That portion of the BMA in unincorporated King County is even smaller and more limited. All of that area is either active river channel or adjacent riparian forest. King County maintains levees and revetments along the lower White River within the cities of Pacific and Auburn. The river through these reaches is channelized and disconnected from its historic floodplain.

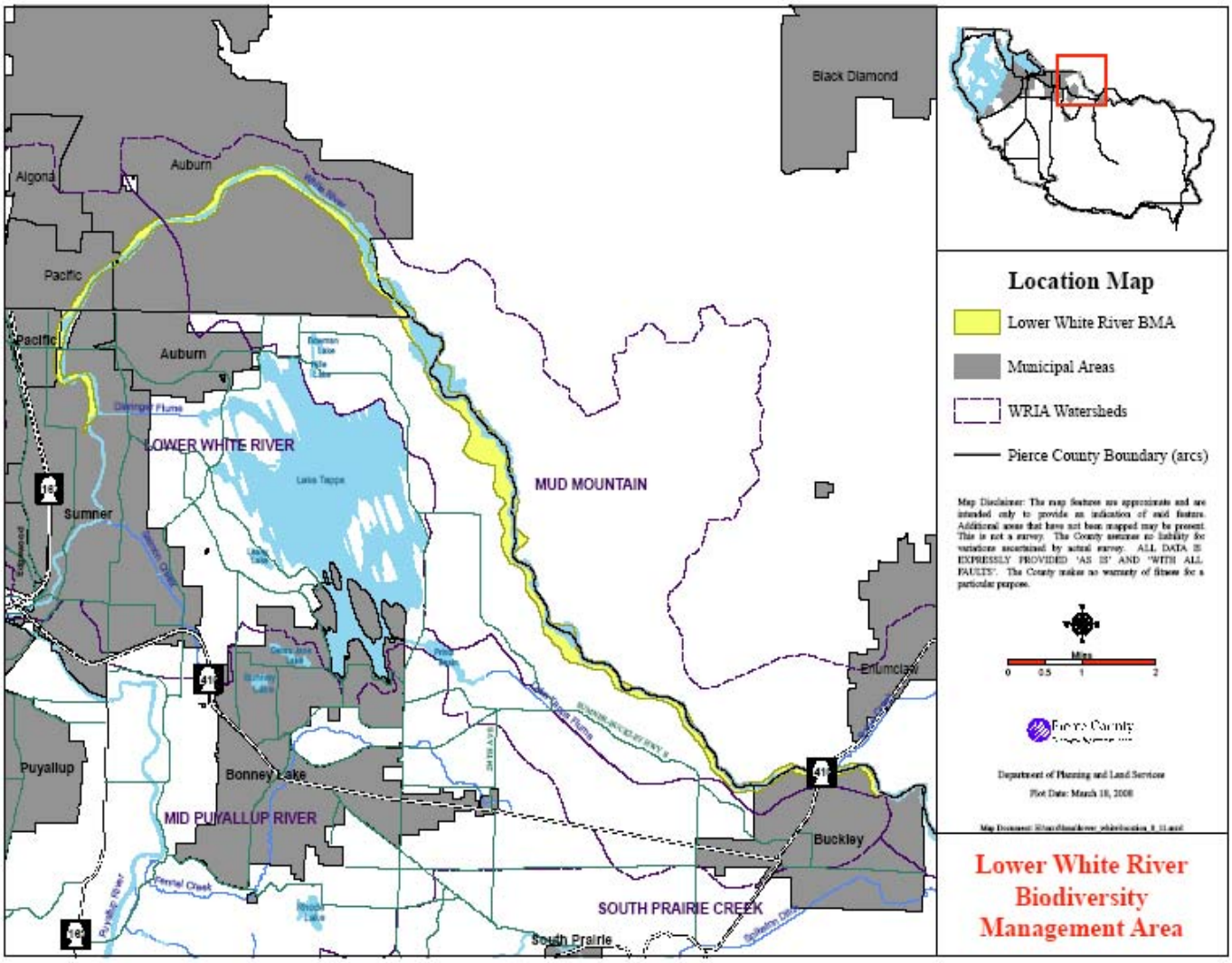


Figure 7. Lower White River BMA Location Map

Current land use is a combination of resource use, residential, civic, vacant, and limited industrial and commercial land use around Sumner, Pacific, and Buckley. In King County, land use is mostly agriculture, tribal lands, and residential around Pacific and Auburn.

Fish and Wildlife Resources

Predicted Wildlife Species (F = federal, S = state, T = threatened, M = monitor, C = candidate, Co = of concern)

The Pierce County Biodiversity Assessment provides a detailed list of predicted species for each of the 16 biodiversity management areas in the biodiversity network. The Painted Turtle is the only trigger species identified for this BMA. There are 6 predicted species listed as at-risk, 16 state or federal listed species and 18 PHS species. The predicted listed species include the Red-Legged Frog (FCo), Western Toad (FCo, SC), Bald Eagle (FT, ST), Great Blue Heron (SM), Green Heron (SM), Olive-sided Flycatcher

(FCo), Osprey (SM), Turkey Vulture (SM), Vaux's Swift (SC), Willow Flycatcher (FCo), Fisher (FCo, SE), Long-eared Myotis (FCo, SM), Long-legged Myotis (FCo, SM), Pacific Water Shrew (SM), Townsend's Big-eared Bat (FCo, SC), and Yuma Myotis (FCo). A total of 6 amphibians, 85 birds, 46 mammals, and 5 reptiles were predicted (see Table 1 – Predicted and Confirmed Wildlife and Fish Species).

The Lower White River supports three salmonid species that are listed as threatened under the Endangered Species Act: Puget Sound Chinook, Puget Sound steelhead, and Coastal-Puget Sound bull trout. The Lower White River is particularly important to Chinook recovery because it is the only population of spring Chinook in south Puget Sound. The Lower White River also supports pink, chum, coho, and sockeye[8] salmon, as well as cutthroat trout. The mouth of Boise Creek falls within the BMA on the King County side. Boise Creek supports Chinook, coho, and pink salmon, steelhead, bull trout, and cutthroat trout.

Gustafson, R.G., T.C. Wainwright, G.A. Winans, F.W. Waknitz, L.T. Parker, and R.S. Waples. 1997. Status review of sockeye salmon from Washington and Oregon. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-33, 282 pp. http://www.nwfsc.noaa.gov/publications/techmemos/tm33/tm33.html#toc

TABLE 1 - PREDICTED AND CONFIRMED WILDLIFE AND FISH SPECIES FOR THE LOWER WHITE RIVER BMA

PREDICTED SPECIES Note: Species observed but not predicted are italicized	Bioblitz 2006 Survey	Bioblitz 2007 Survey
AMPHIBIANS		
Bullfrog[7,8]	X	
Ensatina	X	
Long-toed salamander	X	
Northwestern salamander	X	
Pacific treefrog (Chorus frog)	X	
Red-legged frog [3]	X	
Roughskin newt	X	
Western toad [3,6]	X	
BIRDS		
American bittern [2]		
American coot		
American crow	X	X
American dipper		
American goldfinch	X	
American kestrel	X	
American robin	X	X
Bald eagle [3,4,6]	X	X
Band-tailed pigeon [4]	X	
Bank swallow	X	
Barn swallow	X	
Barred owl[8]	X	
Belted kingfisher	X	X
Bewick's wren	X	X
Black-capped chickadee	X	X
Black-headed grosbeak	X	
Black-throated gray warbler	X	
Blue-winged teal		
Brewer's blackbird	X	
Brown creeper[8]	X	X
Brown-headed cowbird	X	
Bushtit	X	
California quail		
Canada goose	X	X
Cedar waxwing	X	X
Chestnut-backed chickadee[8]	X	X
Cinnamon teal		
Cliff swallow	X	
Common barn-owl	X	

PREDICTED SPECIES Note: Species observed but not predicted are italicized	Bioblitz 2006 Survey	Bioblitz 2007 Survey
BIRDS (Cont'd)		
Common merganser	X	X
Common nighthawk	X	
Common raven	X	
Common snipe		
Common yellowthroat	X	
Cooper's hawk [2]	X	
Dark-eyed junco[8]	X	X
Downy woodpecker	X	X
European starling[7]	X	
Evening grosbeak	X	
Gadwall		
Glaucous-winged gull[8]		X
Golden-crowned kinglet[8]	X	
Great blue heron [3,4,6]	X	X
Great horned owl		
Green heron (Green-backed) [3]	X	X
Green-winged teal		
Hairy woodpecker[8]	X	
Hooded merganser [4]		
House finch	X	
House sparrow[7]	X	
House wren		
Hutton's vireo	X	
Killdeer	X	
Lazuli bunting	X	
Macgillivray's warbler	X	
Mallard	X	X
Marsh wren	X	
Mourning dove[8]	X	
Northern flicker	X	X
Northern harrier		
Northern oriole		
Northern rough-winged swallow	X	
Northern shoveler		
Olive-sided flycatcher [3]	X	
Osprey [3]		X
Pacific slope flycatcher (Western)	X	
Pied-billed grebe [4]		
Pileated woodpecker[6,8]	X	X

TABLE 1 - PREDICTED AND CONFIRMED WILDLIFE AND FISH SPECIES

PREDICTED SPECIES Note: Species observed but not predicted are italicized	Bioblitz 2006 Survey	Bioblitz 2007 Survey
BIRDS (Cont'd)		
Pine siskin[8]	X	
Purple finch	X	
Red-breasted nuthatch[8]	X	X
Red-breasted sapsucker	X	X
Red-eyed vireo	X	
Red-tailed hawk	X	X
Red-winged blackbird	X	X
Rock dove	X	
Ruddy duck		
Ruffed grouse		
Rufous hummingbird	X	X
Savannah sparrow	X	X
Song sparrow	X	X
Sora		
Spotted sandpiper [4]	X	
Spotted towhee (Rufous-sided)	X	X
Steller's jay	X	
Swainson's thrush	X	
Townsend's warbler[8]		X
Tree swallow	X	X
Turkey vulture[3]	X	X
Vaux's swift [3,4,6]	X	
Violet-green swallow	X	X
Warbling vireo	X	
Western meadowlark	X	
Western screech-owl		X
Western tanager[8]	X	
Western wood-pewee	X	
White-crowned sparrow	X	X
Willow flycatcher [3]	X	X
Wilson's warbler	X	
Winter wren[8]	X	X
Wood duck [4]	X	
Yellow warbler[2]	X	X
Yellow-rumped warbler[8]	X	X

PREDICTED SPECIES Note: Species observed but not predicted are italicized	Bioblitz 2006 Survey	Bioblitz 2007 Survey
MAMMALS		
Beaver	X	X
Big brown bat [4]	X	
Black bear		
Black rat[7]		
Black-tailed deer [4]	X	X
Bobcat	X	
California myotis [4]	X	
Coast mole		X
Coyote	X	X
Creeping vole		
Deer mouse	X	X
Douglas squirrel	X	
Dusky (Montane) shrew		
Eastern cottontail[7]	X	X
Eastern gray squirrel[7]	X	X
Elk[8]	X	
Ermine		
Fisher [2,3,4]		
Hoary bat	X	
Little brown myotis [4]	X	
Long-eared myotis [3,4]		
Long-legged myotis [3,4]		
Long-tailed (Forest) deer mouse	X	
Long-tailed vole		
Long-tailed weasel	X	
Mink [4]		X
Mole spp.	X	
Mountain beaver	X	
Mountain lion [7]	X	
Muskrat	X	X
Northern flying squirrel		
Norway rat[7]	X	X
Nutria[7]	X	
Pacific jumping mouse	X	
Pacific water shrew [3]		
Porcupine		

TABLE 1 - PREDICTED AND CONFIRMED WILDLIFE AND FISH SPECIES

PREDICTED SPECIES Note: Species observed but not predicted are italicized	**Bioblitz 2006 Survey**	**Bioblitz 2007 Survey**
MAMMALS (Cont'd)		
Raccoon	X	X
Red fox		
River otter	X	X
Shrew-mole		
Shrew spp.	X	
Silver-haired bat [2]		
Southern red-backed vole		
Spotted skunk		
Striped skunk		
Townsend's big-eared bat [2,3,4]		
Townsend's chipmunk[8]	X	
Townsend's mole		X
Townsend's vole	X	
Vagrant shrew		
Virginia opossum[7]	X	X
Vole spp.	X	
Yuma myotis [3,4]	X	
REPTILES		
Common garter snake [1]	X	X
Northwestern garter snake	X	
Northern alligator lizard	X	X
Painted turtle		
Rubber boa		
Western terrestrial garter snake	X	
FISH		
Prickly sculpin	X	
Sculpin spp.	X	
Speckled dace	X	
Western brook lamprey	X	

Footnote:

(1) - Trigger Species - Species that needed additional mapped land cover units to ensure representation within the network

(2) - At-Risk - Washington Gap Analysis Project (WAGAP) selected species considered to be most as risk of continued or future population declines due to human activities

(3) - Listed (State or Federal) - Species listed as State endangered, threatened, sensitive, candidate or monitor, as well as species listed or proposed for listing by the U.S. Fish and Wildlife Service

(4) - PHS - a species defined as priority under the WDFW Priority Habitats and Species (PHS) Program

(5) - Included based on species significance under the WDFW PHS/Heritage database, although not predicted to occur

(6) - Included in the Washington Comprehensive Wildlife Conservation Strategy list

(7) - Current supporting location data

(8) - Washington Comprehensive Wildlife Conservation Strategy (2005) species recommended for monitoring

Confirmed Fish and Wildlife Species and Habitats

The WDFW Heritage data indicates point locations within the BMA for the following species: Bald Eagle (FT, ST), Great Blue Heron (SM), Vaux's Swift (SC), and Western Brook Lamprey (FCo). The WDFW PHS data designates this area as priority habitat for fish resources and small waterfowl. The Pierce County fish presence maps identify several anadromous fish species within the rivers and stream systems in this BMA including Chinook (FT, SC), chum, coho, pink, and steelhead.

The King County Wildlife Habitat Network, mapped in the County's Comprehensive Plan, runs through the BMA. The Wildlife Habitat Network is protected in the King County Critical Areas Ordinance as a Wildlife Habitat Conservation Area (WHCA). Other WHCA's include the nest and designated buffer areas around the nest of certain species, including bald eagle, osprey, red-tailed hawk, and great blue heron. A bald eagle nest was confirmed in 2002 near the hatchery, though it has not been verified more recently. It is likely osprey and red-tailed hawks are nesting in the area, and great blue herons may be nesting or at the least use the river as forage habitat. The lack of species sightings is because there are few to no roads leading to this area and no development thus far, and as such there have been no sightings of King County species of local importance. (Enumclaw-Buckley Rd. SE crosses the river towards the eastern end of the BMA; otherwise no other public roads are within the BMA in this area).

During the bioblitz event of June 2006, a variety of species were identified and confirmed within the Lower White River BMA within Pierce County (see Table 1 – Predicted and Confirmed Wildlife and Fish Species). Confirmed terrestrial vertebrate species in the Lower White River BMA include 8 amphibian species, 80 bird species, 30 mammal species, and 4 reptile species. Additional species from each group were confirmed during the follow-up bioblitz in June, 2007. A confirmed cougar sighting was reported by the Muckleshoot Tribal biologist within the BMA, although he was not involved in the bioblitz. (See Figure 8 - Fish and Wildlife Resources Map.)

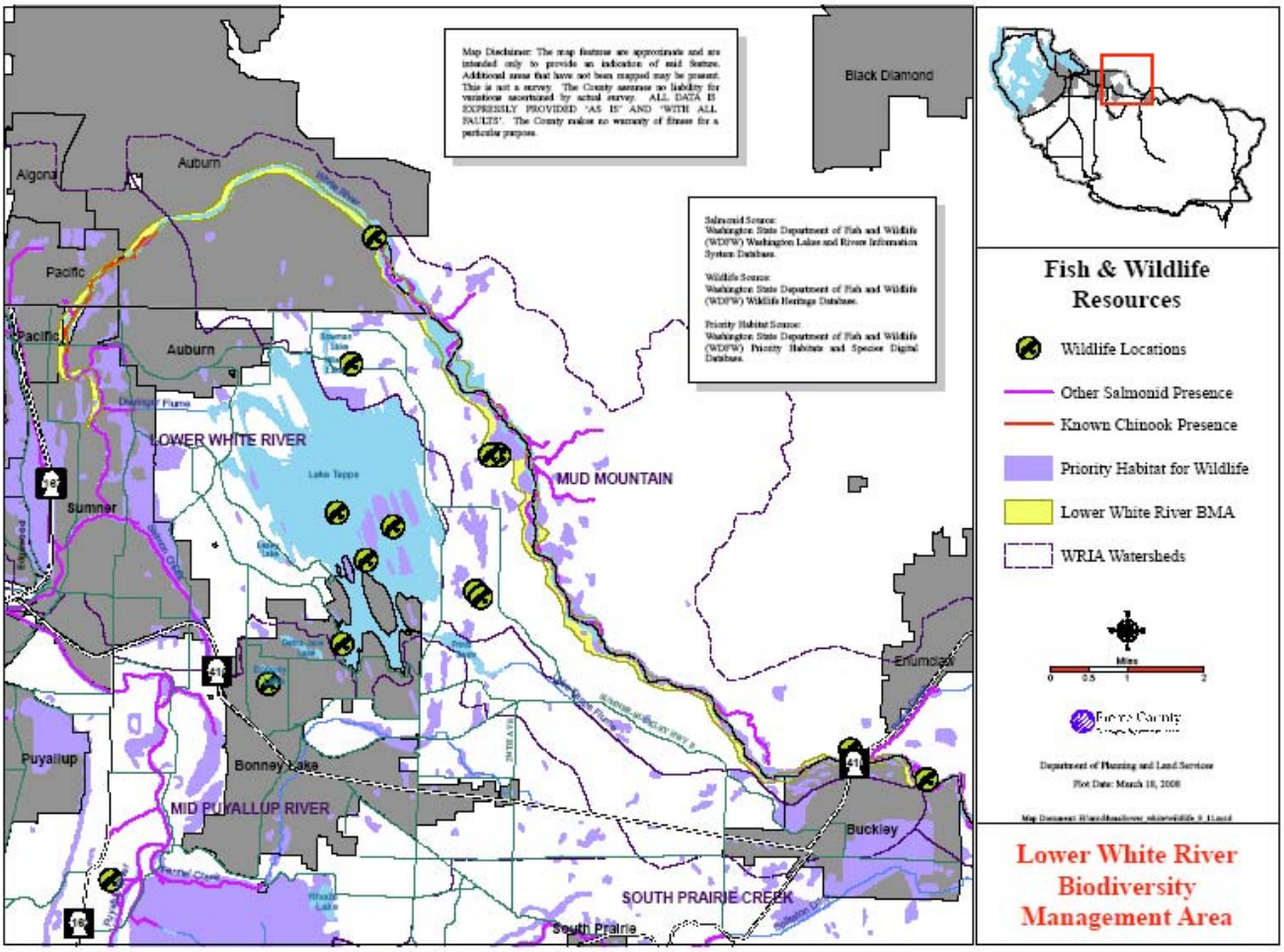


Figure 8. Fish and Wildlife Resources Map

The White River is identified as riparian habitat according to WDFW Priority Habitat and Species Program, and also medium quality riparian salmon habitat. Fall Chinook salmon (FT, SC), Spring Chinook salmon, Coho salmon, Fall Chum salmon, Pink salmon, Sockeye salmon, Bull trout (FT, SC), and Winter Steelhead (FT) fish species have been verified and/or known to occur in the stretch of the White River contained within the LWR BMA[9]. In addition, the draft White River Basin Plan[6] includes anadromous runs of Steelhead and coastal Cutthroat trout. Resident coastal Cutthroat trout and Bull trout also are present. Fall-run Chinook, Chum, and Pink salmon spawning occurs primarily below the diversion dam; Steelhead trout and spring-run Chinook salmon primarily spawn above Mud Mountain Dam, outside of the BMA. Coho salmon and coastal Cutthroat trout spawn and rear primarily in tributary streams throughout the basin. Bull trout spawning occurs only in snowmelt-fed tributaries in the upper

[9] Salmon and Steelhead Habitat Inventory and Assessment Program, http://wdfw.wa.gov/hab/sshiap/)

White River Basin above Mud Mountain Dam. The Muckleshoot Indian Tribe operates the White River Hatchery and the Puyallup Tribe operates 4 spring Chinook acclimation ponds located in the upper White River basin.

Confirmed Invertebrate Species

There are 27 confirmed butterfly species[10] within the Lower White River BMA. The following four butterflies are state-listed: Hydaspe Fritillary (SM), Juba Skipper (SM), Purplish Copper (SM), and Sonora Skipper (SM). The remaining butterfly species include: Anise Swallowtail. Cabbage White, Clodius Parnassian, Echo Blue, Large Wood Nymph, Lorquin's Admiral, Monarch, Mustard White, Mylitta Crescent, Orange Sulphur, Pale Tiger Swallowtail, Pine White, Red Admiral, Ringlet, Sara Orange Tip, Satyr Anglewing, Silvery Blue, Two Banded Checkered Skipper, Western Brown Elfin, Western Meadow Fritillary, Western Tailed Blue, Western Tiger Swallowtail, and Woodland Skipper.

The health of an aquatic ecosystem depends on the health of all its biological components, not just commercially or culturally important species such as salmon. Fish species are supported by the phytoplankton, zooplankton, insects, plants, bacteria, and fungi also inhabiting the waterway.

Benthic (bottom dwelling) invertebrates are effective indicators of the health of watercourses and watersheds. The term "benthic invertebrates" include animals such as aquatic insects (mayflies and stoneflies), snails, clams, crayfish, and aquatic worms. These species represent a diversity of morphological, ecological, and behavioral adaptations to surrounding natural environments (i.e. they have co-evolved with their surrounding ecosystems to preferred locations)[11]. Many factors can affect the types of benthic invertebrates in a system including riparian conditions, thermal regimes, discharge patterns, light penetration, channel gradients, sediment conditions, water, sediment chemistry, and channel stability which is linked to the quantity and size of large woody debris (LWD). Each location along the watercourse continuum will contain a variety of habitats, such as riffles, pools, sloughs, bars, and backwaters, which differ in respect to substrate type and stability, current velocity, and water depth. Each location in the watercourse has a range of natural conditions that, when coupled with environmental requirements of the invertebrate species, determine whether a given organism can live in a particular habitat at a particular point.

These patterns of species distribution are affected by actions that alter the landscape (e.g. wild fires, logging, earthquakes, agriculture, volcanic eruptions, and urbanization), modify hydrologic conditions (changes in evapotranspiration and runoff or construction of reservoirs and irrigation diversions), modify habitats (snagging operations, channel dredging, sedimentation, hurricanes), or add chemicals that are toxic or that elevate nutrient or organic loads. Organisms vary in their tolerance of degradation caused by human actions; some require clean, clear water while others occupy a wide range of conditions (i.e. generally tolerant of the effects caused by human alterations) [12]. As the natural environment is altered by human activities, changes start to occur in the type of benthic invertebrate species that inhabit a waterway Those less tolerant to human alterations begin to disappear and others that are more tolerant appear more abundantly or replace other species altogether. In an effort to understand the health of a particular waterway (e.g. creek, stream, river) benthic invertebrate samples are collected at various intervals along

[10] Washington State Butterfly Atlas

[11] Cuffney, T.F., Gurtz, M.E., and Meador, M.R., 1993, Methods for collecting benthic invertebrate samples as part of the National Water-Quality Assessment Program: U.S. Geological Survey Open-File Report 93-406, 66 p.

[12] "Restoring Life in Running Waters," James R. Karr and Ellen W. Chu, 1998 and "Biological Assessment: Using Biology to Measure the Health of Watersheds," James R. Karr.

the reach to assess the quality of the system. Species are typically categorized in groups including:

- Group 1 - those organisms which are generally pollution intolerant and signify excellent-good water quality including riffle beetle, stonefly, caddisfly, mayfly, and snail;
- Group 2 – those organisms that exist in a wide range of water quality conditions including cranefly, dragonfly, crayfish, sowbug, filtering caddisfly, blackfly, scud, and dobsonfly; and
- Group 3 – those organisms that are generally tolerant of pollution and whose presence generally indicates fair-poor water quality conditions including midge, pouch snail and aquatic worm.

During the bioblitz event of June 2006, 98 terrestrial and 16 benthic invertebrate species were recorded. Eleven of the terrestrial invertebrates were non-native. Ten more terrestrial species were identified in the April 2007 bioblitz (See Table 2). The benthic sample size was too small to assess the overall water quality of the Lower White River. However, it was also found to support at least some taxa that are relatively intolerant to pollution. This indicates that general water quality in the river is relatively good.

TABLE 2 - CONFIRMED TERRESTRIAL AND AQUATIC INVERTEBRATES FOR THE LOWER WHITE RIVER BMA

	Order	Family	Genus/Species	Common
Ants	Hymenoptera	Formicidae	*sp. 1*	Moss Ant
Bees	Hymenoptera	Apidae	*Bombus sp.*	
Beetles	Coleoptera	Carabidae	*Carabus nemoralis*	Carabid Beetle
Beetles	Coleoptera	Carabidae	*Cicindela oregano*	Tiger Beetle
Beetles	Coleoptera	Carabidae	*Harpalini sp.*	Black Ground Beetle
Beetles	Coleoptera	Carabidae	*Nubius sp.*	
Beetles	Coleoptera	Carabidae	*Scaphinopus sp.*	Small Slug Killer
Beetles	Coleoptera	Chrysomelidae	*Altica ambiens*	Alder Flea Beetle
Beetles	Coleoptera		*Cicindela depressula*	Ground Beetle
Beetles	Coleoptera		*Scaphinotus angusticollis*	Ground Beetle
Beetles	Coleoptera		*Cychrus tuberculatus*	Ground Beetle
Beetles	Coleoptera		*Nebria piperi*	Ground Beetle
Beetles	Coleoptera		*Nebria eschscholtsii*	Ground Beetle
Beetles	Coleoptera		*Nebria gyenhali*	Ground Beetle
Beetles	Coleoptera		*Nebria crassicornis*	Ground Beetle
Beetles	Coleoptera		*Diplous aterrimus*	Ground Beetle
Beetles	Coleoptera		*Loricara decimpucatata*	Ground Beetle
Beetles	Coleoptera		*Harpalus carbonatus*	Ground Beetle
Beetles	Coleoptera		*Harpalus seclusus*	Ground Beetle
Beetles	Coleoptera		*Harpalus affinis*	Ground Beetle
Beetles	Coleoptera		*Pterostichis algidus*	Ground Beetle
Beetles	Coleoptera		*Pterostichus creniculus*	Ground Beetle
Beetles	Coleoptera		*Pterostichus herculeanus*	Ground Beetle
Beetles	Coleoptera		*Bembidion platinoides*	Ground Beetle
Beetles	Coleoptera		*Acupalpus*	Ground Beetle
Beetles	Coleoptera		*Trechus obtusus*	Ground Beetle
Beetles	Coleoptera		*Tachys*	Ground Beetle
Beetles	Staphylidae	Osoriinae		Rove Beetle
Butterflies/Moths	Lepidoptera	Arctiidae	*Tyria jacobaeae*	Cinnabar Moth
Caddisflies	Trichoptera	Brachycentusidae	*Brachycentridae*	
Caddisflies	Trichoptera		*Rhyacophila*	Caddisfly
Caddisflies	Trichoptera		*Lepidostoma*	
Centipede	Myriopoda	Lithobiidae	*sp. 1*	Centipede
Crustacean	Crustacea	Ligiidae	*Ligidium gracile*	Isopod
Dragonflies	Odonata	Libellulidae	*Libellula forensis*	Eight Spotted Skimmer
Flies	Diptera	Chironomidae	*Chironomidae*	
Flies	Diptera	Simuliidae	*Simuliidae*	
Flies	Diptera	Tipulidae	*Tipula*	
Flies	Diptera		*Chelifera*	
Leafhoppers	Hemiptera			Tree Hopper
Mayflies	Ephemeroptera	Baetidae	*Baetis tricaudatus*	
Mayflies	Ephemeroptera	Heptageniidae	*Cinygmula*	
Mayflies	Ephemeroptera		*Ephemerellidae*	
Mayflies	Ephemeroptera		*Ameletus*	
Mayflies	Ephemeroptera		*Caudatella hystrix*	
Mayflies	Ephemeroptera		*Epeorus longimanus*	

TABLE 2 - CONFIRMED TERRESTRIAL AND AQUATIC INVERTEBRATES FOR THE LOWER WHITE RIVER BMA

	Order	Family	Genus/Species	Common
Millipedes	Diplopoda	Parajulidae	*sp. 1*	Millipede
Millipedes	Diplopoda	Parajulidae	*sp. 2*	Millipede
Mollusks	Gastropoda	Arionidae	*Arion ater*	European Black Slug
Mollusks	Gastropoda	Pupillidae		Minute snail
Mollusks	Gastropoda	Sminthuridae	*sp. 1*	Snail
Sawflies	Hymenoptera			Wood Sawfly
Snails & Slugs	Gastropoda	Agriolimacidae	*Deroceras reticulaturm*	Grey Field Slug
Snails & Slugs	Gastropoda	Arionidae	*Ariolimax columbianus*	Pacific Banana Slug
Snails & Slugs	Gastropoda	Arionidae	*Arion intermedius*	Hedgehog Arion
Snails & Slugs	Gastropoda	Arionidae	*Arion rufus*	Chocolate Arion
Snails & Slugs	Gastropoda	Arionidae	*Arion subfuscus*	
Snails & Slugs	Gastropoda	Arionidae	*Prophysaon vanattae*	Scarletback Tailchropper
Snails & Slugs	Gastropoda	Bradybaenidae	*Monadenia fidelis*	Pacific Sideband
Snails & Slugs	Gastropoda	Corychiidae	*Carychium occidentale*	Western Thorn
Snails & Slugs	Gastropoda	Daubebariidae	*Oxychilus alliarius*	Garlic Glass-snail
Snails & Slugs	Gastropoda	Euconulidae	*Euconulus fulvus*	Brown Hive
Snails & Slugs	Gastropoda	Gastrodontidae	*Striatura pugentensis*	Northwest Striate
Snails & Slugs	Gastropoda	Haplotrematidae	*Ancotrema sportella*	Beaded Lancetooth
Snails & Slugs	Gastropoda	Haplotrematidae	*Haplotrtema vancouverense*	Robust Lancetooth
Snails & Slugs	Gastropoda	Helicidae	*Cepaea nemoralis*	Grow Snail
Snails & Slugs	Gastropoda	Helicidae	*Cornu aspersum*	Grown Garden Snail
Snails & Slugs	Gastropoda	Limacidae	*Limax maximus*	Giant Garden Slug
Snails & Slugs	Gastropoda	Polygyridae	*Allogona townsendiana*	Oregon Forest Snail
Snails & Slugs	Gastropoda	Polygyridae	*Cryptomastix devia*	Puget Oregonian
Snails & Slugs	Gastropoda	Polygyridae	*Cryptomastix germana*	Pygmy Oregonian
Snails & Slugs	Gastropoda	Polygyridae	*Vespericola columbianus*	Northwest Hesperian
Snails & Slugs	Gastropoda	Pristilomatidae	*Pristiloma stearnsii*	Striate Tightcoil
Snails & Slugs	Gastropoda	Vertiginidae	*Columella edentula*	Toothless Column
Snakeflies	Raphidioptera		*sp. 1*	Snakefly
Spiders	Araneae	Agelenidae	*Agelenopsis sp. 1*	Funnel web spiders
Spiders	Araneae	Agelenidae	*Calymmaria sp. 1*	Funnel web spiders
Spiders	Araneae	Agelenidae	*Cicurina pusilla*	Funnel web spiders
Spiders	Araneae	Agelenidae	*Cicurina sp. 1*	Funnel web spiders
Spiders	Araneae	Agelenidae	*Cryphoeca exlineae*	Funnel web spiders
Spiders	Araneae	Agelenidae	*Cybaeus sp.*	Funnel web spiders
Spiders	Araneae	Amaurobiidae	*Callobius pictus*	Spider
Spiders	Araneae	Amaurobiidae	*Callobius sp. 1*	Spider
Spiders	Araneae	Araneidae	*Araneus sp. 1*	
Spiders	Araneae	Araneidae	*Cyclosa conica*	
Spiders	Araneae	Clubionidae	*Clubiona sp. 1*	
Spiders	Araneae	Clubionidae	*Phruotimpus borealis*	
Spiders	Araneae	Dictynidae	*Dictyna sp. 1*	Spider
Spiders	Araneae	Gnaphosidae	*Zelotes fratris*	Ground spiders
Spiders	Araneae	Hahniidae	*Hahnia cinerea*	Dwarf sheet spider
Spiders	Opiliones	Ischyropsalididae	*Hesperonemastoma modestum*	Harvestmen
Spiders	Opiliones	Ischyropsalididae	*Sabacon occidentalis*	Harvestmen

TABLE 2 - CONFIRMED TERRESTRIAL AND AQUATIC INVERTEBRATES FOR THE LOWER WHITE RIVER BMA

	Order	Family	Genus/Species	Common
Spiders	Araneae	Linyphiidae	*Ceratinella sp. 1*	Sheeweb weavers
Spiders	Araneae	Linyphiidae	*Entelecara acuminata*	Sheeweb weavers
Spiders	Araneae	Linyphiidae	*Lepthyphantes zibus*	Sheeweb weavers
Spiders	Araneae	Linyphiidae	*Neriene litigiosa*	Sheeweb weavers
Spiders	Araneae	Linyphiidae	*Wubana pacifica*	Sheeweb weavers
Spiders	Araneae	Lycosiadae	*Pardosa dosuncata*	Wolf spiders
Spiders	Araneae	Lycosiadae	*Pardosa vancouveri*	Wolf spiders
Spiders	Araneae	Lycosiadae	*Tarentula kochii*	Wolf spiders
Spiders	Opiliones	Phalangiidae	*Leptobunus sp. 1*	Harvestmen
Spiders	Opiliones	Phalangiidae	*Paraplatybunus triangularis*	Harvestmen
Spiders	Araneae	Salticidae	*Calticus scenicus*	
Spiders	Araneae	Salticidae	*Evarcha proszynskii*	
Spiders	Araneae	Salticidae	*Neon reticulatus*	
Spiders	Araneae	Salticidae	*Phanias albeolus*	Jumping spiders
Spiders	Araneae	Tetragnathidae	*Metellina curtisi*	
Spiders	Araneae	Tetragnathidae	*Tetragnatha laboriosa*	
Spiders	Araneae	Theridiidae	*Enoplognatha ovata*	
Spiders	Araneae	Theridiidae	*Theridion bimaculatum*	
Spiders	Araneae	Theridiidae	*Theridion sexpunctatum*	
Spiders	Araneae	Theridiidae	*Theridion simile*	
Spiders	Araneae	Theridiidae	*Theridion tinctum*	
Spiders	Araneae	Theridiidae	*Theridion varians*	
Spiders	Araneae	Thomisidae	*Misumena vatia*	Crab spiders
Spiders	Araneae	Thomisidae	*Ozyptila pacifica*	Crab spiders
Spiders	Araneae	Thomisidae	*Philodromus dispar*	Crab spiders
Spiders	Araneae	Thomisidae	*Philodromus josemitensis*	Crab spiders
Spiders	Araneae	Thomisidae	*Xysticus pretiosus*	Crab spiders
Stoneflies	Plecoptera	Chloroperlidae	*Sweltsa*	
True bugs	Hemiptera			True bug
True bugs	Heteroptera	Miridae		Plant bug
Worms	Oligochaeta		*sp. 1*	
Worms	Oligochaeta			Earth worms

Confirmed Plant Species

During the bioblitz event of June 2006 plant specialists collected a variety of native and introduced plant species within the Lower White River BMA. A complete listing of native plants is detailed in Table 3. Table 4 provides a list of introduced plant species.

TABLE 3 - 2006, 2007 LOWER WHITE RIVER BIOBLITZ PLANT INVENTORY		
Common name	**Scientific name**	**Plant family**
Big-leaf maple	*Acer macrophyllum*	Aceraceae
Vine maple	*Acer circinatum*	Aceraceae
American waterplantain	*Alisma plantago-aquatica*	Alismataceae
Cow parsnip	*Heracleum lanatum*	Apiaceae
Sweet cicely	*Osmorhiza chilensis*	Apiaceae
Water parsley	*Oenanthe sarmentosa*	Apiaceae
Western sweet-cicely	*Osmorhiza occidentalis*	Apiaceae
Devil's club	*Oplopanax horridum*	Araliaceae
Wild ginger	*Asarum caudatum*	Aristolochiaceae
Coltsfoot	*Petasites frigidus*	Asteraceae
Composite sp.	*Composite sp.*	Asteraceae
Douglas' sagewort	*Artemesia douglasiana*	Asteraceae
Hawksbeard sp.	*Crepis sp.*	Asteraceae
Pearly everlasting	*Anaphalis margaritacea*	Asteraceae
Suksdorf's sagewort	*Artemesia suksdorfii*	Asteraceae
White-flowered hawkweed	*Hieracium albiflorum*	Asteraceae
Yarrow	*Achillea millifolium*	Asteraceae
Cascade Oregongrape	*Berberis nervosa*	Berberidaceae
Tall Oregongrape	*Berberis aquifolium*	Berberidaceae
Vanilla leaf	*Achlys triphylla*	Berberidaceae
Hazelnut	*Corylus cornuta*	Betulaceae
Red alder	*Alnus rubra*	Betulaceae
Forget-me-not	*Myosotis sylvatica*	Boraginaceae
Small-flowered forget-me-not	*Myosotis laxa*	Boraginaceae
American wintercress	*Barbarea orthoceras*	Brassicaceae
Bittercress	*Cardamine sp.*	Brassicaceae
Field pepperweed	*Lepidium campestre*	Brassicaceae
Little Western bittercress	*Cardamine hirsuta*	Brassicaceae
Spring beauty	*Cardamine pulcherrima*	Brassicaceae
Spring whitlow-grass	*Draba verna*	Brassicaceae
Butterflybush	*Buddleja davidsonii*	Buddlejaceae
Different-leaved water-starwort	*Callitriche heterophylla*	Callitrichaceae
Pond water-starwort	*Callitriche stagnalis*	Callitrichaceae
Common snowberry	*Symphoricarpos albus*	Caprifoliaceae
Creeping snowberry	*Symphoricarpos mollis*	Caprifoliaceae
Orange honeysuckle	*Lonicera ciliosa*	Caprifoliaceae
Red elderberry	*Sambucus racemosa*	Caprifoliaceae
Twinberry	*Lonicera involucrata*	Caprifoliaceae
Twinflower	*Linnaea borealis*	Caprifoliaceae
Crisped starwort	*Stellaria crispa*	Caryophyllaceae
Munchkin chickweed	*Moenchia erecta (Kozloff)*	Caryophyllaceae
Northern starwort	*Stellaria calycantha*	Caryophyllaceae
Pacific dogwood	*Cornus nuttallii*	Cornaceae
Red-osier dogwood	*Cornus stolonifera*	Cornaceae
Pacific stonecrop	*Sedum divergens*	Crassulaceae
Spearleaf stonecrop	*Sedum lanceolatum*	Crassulaceae
Western red cedar	*Thuja plicata*	Cupressaceae
Dewey's sedge	*Carex deweyana*	Cyperaceae
Henderson's sedge	*Carex hendersonii*	Cyperaceae

TABLE 3 - 2006, 2007 LOWER WHITE RIVER BIOBLITZ PLANT INVENTORY		
Common name	**Scientific name**	**Plant family**
Sawbeak sedge	*Carex stipata*	Cyperaceae
Sedge	*Carex sp.*	Cyperaceae
Slough sedge	*Carex obnupta*	Cyperaceae
Small-flowered bulrush	*Scirpus microcarpus*	Cyperaceae
Woolgrass	*Scirpus cyperinus*	Cyperaceae
Common horsetail	*Equisetum arvense*	Equisetaceae
Giant horsetail	*Equisetum telmateia*	Equisetaceae
Scouring rush	*Equisetum hyemale*	Equisetaceae
Water horsetail	*Equisetum fluviatile*	Equisetaceae
Bearberry	*Arctostaphylos uva-ursi*	Ericaceae
Pacific madrone	*Arbutus menziesii*	Ericaceae
Pink wintergreen	*Pyrola asarifolia*	Ericaceae
Red huckleberry	*Vaccinium parvifolium*	Ericaceae
Salal	*Gaultheria shallon*	Ericaceae
Single-flowered indian pipe	*Monotropa uniflora*	Ericaceae
American vetch	*Vicia americana*	Fabaceae
Clover	*Trifolium sp.*	Fabaceae
Miniature lotus	*Lotus micranthus*	Fabaceae
Tiny vetch	*Vicia tetrasperma*	Fabaceae
Two-color lupine	*Lupinus bicolor*	Fabaceae
Vetch sp.	*Vicia sp.*	Fabaceae
Black oak	*Quercus sp.*	Fagaceae
Bleeding heart	*Dicentra formosa*	Fumariaceae
Western corydalis	*Corydalis scouleri*	Fumariaceae
Coast black gooseberry	*Ribes divaricatum*	Grossulariaceae
Gummy gooseberry	*Ribes lobbii*	Grossulariaceae
Prickly currant	*Ribes lacustre*	Grossulariaceae
Red-flowered currant	*Ribes sanguinium*	Grossulariaceae
Mock-orange	*Philadelphus lewisii*	Hydrangeaceae
Pacific waterleaf	*Hydrophyllum tenuipes*	Hydrophyllaceae
Small-flowered nemophila	*Nemophila parviflora*	Hydrophyllaceae
Daggerleaf rush	*Juncus ensifolius*	Juncaceae
Field woodrush	*Luzula campestris*	Juncaceae
Rush sp.	*Juncus sp.*	Juncaceae
Slender rush	*Juncus tenuis*	Juncaceae
Small-flowered woodrush	*Luzula parviflora*	Juncaceae
Soft rush	*Juncus effusus*	Juncaceae
Cooley's hedge-nettle	*Stachys cooleyae*	Lamiaceae
Hedge nettle	*Stachys sp.*	Lamiaceae
Self-heal	*Prunella vulgaris*	Lamiaceae
Great duckweed	*Spirodela polyrhiza*	Lemnaceae
Water lentil	*Lemna minor*	Lemnaceae
Clasping-leaved twisted-stalk	*Streptopus amplexifolius*	Liliaceae
False lily-of-the-valley	*Maianthemum dilatatum*	Liliaceae
False Solomon's seal	*Smilacina racemosa*	Liliaceae
Hooker fairy-bell	*Disporum hookeri*	Liliaceae
Star-flowered Solomon's seal	*Smilacina stellata*	Liliaceae

TABLE 3 - 2006, 2007 LOWER WHITE RIVER BIOBLITZ PLANT INVENTORY		
Common name	**Scientific name**	**Plant family**
White trillium	*Trillium ovatum*	Liliaceae
Oregon ash	*Fraxinus latifolia*	Oleaceae
Privet sp.	*Liquistrium sp.*	Oleaceae
Enchanter's nightshade	*Circaea alpina*	Onagraceae
Evening primrose	*Oenothera biennis*	Onagraceae
Fireweed	*Epilobium angustifolium*	Onagraceae
Rattlesnake-plantain	*Goodyera oblongifolia*	Orchidaceae
Oregon oxalis	*Oxalis oregana*	Oxalidaceae
California poppy	*Eschcholzia californica*	Papaveraceae
2 needle pine	*Pinus sp.*	Pinaceae
Douglas fir	*Pseudotsuga menziesii*	Pinaceae
Grand fir	*Abies grandis*	Pinaceae
Lodgepole pine	*Pinus contorta*	Pinaceae
Sitka spruce	*Picea sitchensis*	Pinaceae
Western hemlock	*Tsuga heterophylla*	Pinaceae
Annual bluegrass	*Poa annua*	Poaceae
Blue wild rye	*Elymus glaucus*	Poaceae
Brome sp.	*Bromus sp.*	Poaceae
Common brome	*Bromus vulgaris*	Poaceae
Hairy brome	*Bromus commutatus*	Poaceae
Mannagrass	*Glyceria sp.*	Poaceae
Nodding trisetum	*Trisetum cernuum*	Poaceae
Northern mannagass	*Glyceria borealis*	Poaceae
Pacific brome	*Bromus pacificus*	Poaceae
Roughstalk bluegrass	*Poa trivialis*	Poaceae
Water foxtail	*Alopecurus geniculatus*	Poaceae
Western fescue	*Festuca occidentalis*	Poaceae
Bracken	*Pteridium aquilinum*	Polypodiaceae
Deer fern	*Blechnum spicant*	Polypodiaceae
Lady fern	*Athyrium filix-femina*	Polypodiaceae
Licorice fern	*Polypodium glycyrrhiza*	Polypodiaceae
Maidenhair fern	*Adiantum pedatum*	Polypodiaceae
Oak fern	*Gymnocarpium dryopteris*	Polypodiaceae
Spreading wood-fern	*Dryopteris austriaca*	Polypodiaceae
Sword fern	*Polystichum munitum*	Polypodiaceae
Candyflower	*Montia siberica*	Portulacaceae
Miner's lettuce	*Montia perfoliata*	Portulacaceae
Water chickweed	*Montia fontana*	Portulacaceae
	Montia parvigez (Kozloff)	Portulacaceae
Broadleaved starflower	*Trientalis latifolia*	Primulaceae
Baneberry	*Actaea rubra*	Ranunculaceae
Little buttercup	*Ranunculus uncinatus*	Ranunculaceae
Cascara	*Rhamnus purshiana*	Rhamnaceae
Baldhip rose	*Rosa gymnocarpa*	Rosaceae
Black hawthorn	*Crataegus douglasii*	Rosaceae

TABLE 3 - 2006, 2007 LOWER WHITE RIVER BIOBLITZ PLANT INVENTORY		
Common name	**Scientific name**	**Plant family**
Blackcap	*Rubus leucodermis*	Rosaceae
Cherry	*Prunus sp.*	Rosaceae
Coastal strawberry	*Fragaria chiloensis*	Rosaceae
Field strawberry	*Fragaria virginiana*	Rosaceae
Goatsbeard	*Aruncus sylvester*	Rosaceae
Hardhack	*Spiraea douglasii*	Rosaceae
Indian plum	*Oemlaria cerasiformus*	Rosaceae
Large-leaved avens	*Geum macrophyllum*	Rosaceae
Nootka rose	*Rosa nutkana*	Rosaceae
Ocean spray	*Holodiscus discolor*	Rosaceae
Ornamental rose	*Rosa sp.*	Rosaceae
Pacific crabapple	*Malus fusca*	Rosaceae
Pacific ninebark	*Physocarpus capitatus*	Rosaceae
Pacific silverweed	*Potentilla pacifica*	Rosaceae
Pear	*Pyrus communis*	Rosaceae
Salmonberry	*Rubus spectabilus*	Rosaceae
Serviceberry	*Amelanchier alnifolia*	Rosaceae
Sour cherry	*Prunus cerasus*	Rosaceae
Thimbleberry	*Rubus parviflorus*	Rosaceae
Western lady's mantle	*Alchemilla occidentalis*	Rosaceae
Western lady's mantle	*Aphanes arvensis*	Rosaceae
Wild blackberry	*Rubus ursinus*	Rosaceae
Wild strawberry	*Fragaria vesca*	Rosaceae
Cleavers	*Galium aparine*	Rubiaceae
Fragrant bedstraw	*Galium triflorum*	Rubiaceae
Black cottonwood	*Populus trichocarpa*	Salicaceae
Hooker's willow	*Salix hookeriana*	Salicaceae
Pacific willow	*Salix lasiandra*	Salicaceae
Quaking aspen	*Populus tremuloides*	Salicaceae
Scouler willow	*Salix scouleriana*	Salicaceae
Sitka willow	*Salix sitchensis*	Salicaceae
Willow	*Salix sp.*	Salicaceae
Fringecup	*Tellima grandiflora*	Saxifragaceae
Leafy miterwort	*Mitella caulescens*	Saxifragaceae
Youth-on-age	*Tolmiea menziesii*	Saxifragaceae
American brooklime	*Veronica americana*	Scrophulariaceae
Purslane speedwell	*Veronica peregrina*	Scrophulariaceae
Thyme-leaf speedwell	*Veronica serpyllifolia*	Scrophulariaceae
Water speedwell	*Veronica anagallis-aquatica*	Scrophulariaceae
Black nightshade	*Solanum nigrum*	Solanaceae
Common cattail	*Typha latifolia*	Typhaceae
Stinging nettle	*Urtica dioica*	Urticaceae
Stream violet	*Viola glabella*	Violaceae

TABLE 4 - 2006, 2007 LOWER WHITE RIVER BIOBLITZ PLANT INVENTORY (* NON-NATIVE/INTRODUCED PLANTS)		
Common name	**Scientific name**	**Plant family**
Sugar maple	*Acer saccharum**	Aceraceae
Daffodil	*Narcissus pseudonarcissus**	Amaryllidaceae
Chervil	*Anthriscus scandicina**	Apiaceae
Poison hemlock	*Conium maculatum**	Apiaceae
English holly	*Ilex aquifolium**	Aquifoliaceae
English ivy	*Hedera helix**	Araliaceae
Bull thistle	*Circium vulgare**	Asteraceae
Canada thistle	*Circium arvense**	Asteraceae
Common burdock	*Arctium minus**	Asteraceae
Common groundsel	*Senecio vulgaris**	Asteraceae
Common tansy	*Tanacetum vulgare**	Asteraceae
Dandelion	*Taraxacum officinale**	Asteraceae
European daisy	*Bellis perennis**	Asteraceae
Field sowthistle	*Sonchus arvensis**	Asteraceae
Hairy cat's-ear	*Hypochaeris radicata**	Asteraceae
Nipplewort	*Lapsana communis**	Asteraceae
Ox-eye daisy	*Chrysanthemum leucanthemum**	Asteraceae
Spotted knapweed	*Centaurea maculosa**	Asteraceae
Tansy ragwort	*Senecio jacobaea**	Asteraceae
Wall lettuce	*Lactuca muralis**	Asteraceae
Common forget-me-not	*Myosotis scorpioides**	Boraginaceae
Yellow & blue forget-me-not	*Myosotis discolor**	Boraginaceae
Common mustard	*Brassica campestris**	Brassicaceae
Hedge mustard	*Sisymbrium officinale**	Brassicaceae
Pepper weed	*Lepidium campestre**	Brassicaceae
Shepherd's purse	*Capsella bursa-pastoris**	Brassicaceae
Teesdalia	*Teesdalia nudicaulis**	Brassicaceae
Thale cress	*Arabidopsis thaliana**	Brassicaceae
Common chickweed	*Stellaria media**	Caryophyllaceae
Mouse-ear chickweed	*Cerastium vulgatum**	Caryophyllaceae
Sticky chickweed	*Cerastium viscosum**	Caryophyllaceae
Field morning-glory	*Convolvulus arvensis**	Convolvulaceae
Teasel	*Dipsacus sylvestris**	Dipsacaceae
Birdsfoot trefoil	*Lotus corniculatus**	Fabaceae
Black medic	*Medicago lupulina**	Fabaceae
Common vetch	*Vicia sativa**	Fabaceae
Cow vetch	*Vicia cracca**	Fabaceae
Everlasting peavine	*Lathyrus latifolius**	Fabaceae
Least hop clover	*Trifolium dubium**	Fabaceae
Red clover	*Trifolium pratense**	Fabaceae
Scot's broom	*Cytisus scoparius**	Fabaceae
Tiny vetch	*Vicia hirsuta**	Fabaceae
White clover	*Trifolium repens**	Fabaceae
White sweet-clover	*Melilotus alba**	Fabaceae
Cut-leaf geranium	*Geranium dissectum**	Geraniaceae
Dovefoot geranium	*Geranium molle**	Geraniaceae
Filaree	*Erodium cicutarium**	Geraniaceae
Stinky Bob	*Geranium robertianum**	Geraniaceae

TABLE 4 - 2006, 2007 LOWER WHITE RIVER BIOBLITZ PLANT INVENTORY (* NON-NATIVE/INTRODUCED PLANTS)		
Common name	**Scientific name**	**Plant family**
Horse chestnut	*Aesculus hippocastaneum**	Hippocastanaceae
Klamath weed	*Hypericum perforatum**	Hypericaceae
Toad rush	*Juncus bufonius**	Juncaceae
Creeping Charlie	*Glecoma hederacea**	Lamiaceae
Red dead-nettle	*Lamium purpureum**	Lamiaceae
Grape hyacinth	*Muscari botryoides**	Liliaceae
Spanish squill	*Hyancinthoides hispanica**	Liliaceae
Hops	*Humulus lupulus**	Moraceae
Watson's willow-herb	*Epilobium cilatum**	Onagraceae
Watson's willow-herb	*Epilobium cilatum watsonii**	Onagraceae
Common plantain	*Plantago major**	Plantaginaceae
English plantain	*Plantago lanceolata**	Plantaginaceae
Barren fescue	*Festuca bromoides**	Poaceae
Bulbous bluegrass	*Poa bulbosa**	Poaceae
Common velvet grass	*Holcus lanatus**	Poaceae
Early hairgrass	*Aira praecox**	Poaceae
English ryegrass	*Lolium perenne**	Poaceae
Fowl bluegrass (meadow grass)	*Poa palustris**	Poaceae
Italian ryegrass	*Lolium multiflorum**	Poaceae
Kentucky bluegrass	*Poa pratensis**	Poaceae
Orchard grass	*Dactylis glomerata**	Poaceae
Quack grass	*Agropyron repens**	Poaceae
Rat-tail fescue	*Festuca myuros**	Poaceae
Reed canarygrass	*Phalaris arundinacea**	Poaceae
Silver hairgrass	*Aira caryophyllea**	Poaceae
Soft brome	*Bromus mollis**	Poaceae
Sweet vernalgrass	*Anthoxanthum odoratum**	Poaceae
Tall fescue	*Festuca arundinacea**	Poaceae
Bohemian knotweed	*Polygonum 1. bohemicum**	Polygonaceae
Broad-leaved dock	*Rumex obtusifolius**	Polygonaceae
Japanese knotweed	*Polygonum cuspidatum**	Polygonaceae
Sheep sorrel	*Rumex acetocella**	Polygonaceae
Sour dock	*Rumex crispus**	Polygonaceae
Creeping buttercup	*Ranunculus repens**	Ranunculaceae
Meadow buttercup	*Ranunculus acris**	Ranunculaceae
English hawthorn	*Crataegus monogyna**	Rosaceae
European mountain-ash	*Sorbus aucuparia**	Rosaceae
Evergreen blackberry	*Rubus laciniatus**	Rosaceae
Himalayan blackberry	*Rubus discolor**	Rosaceae
Japanese rambler rose	*Rosa multiflora**	Rosaceae
Ornamental/cultivated Apple	*Pyrus malus**	Rosaceae
Sweet cherry	*Prunus avium**	Rosaceae
White poplar	*Populus alba**	Salicaceae
Common mullein	*Verbascum thapsus**	Scrophulariaceae
Common speedwell	*Veronica officinalis**	Scrophulariaceae

TABLE 4 - 2006, 2007 LOWER WHITE RIVER BIOBLITZ PLANT INVENTORY (* NON-NATIVE/INTRODUCED PLANTS)		
Common name	**Scientific name**	**Plant family**
Field veronica	*Veronica arvensis**	Scrophulariaceae
Foxglove	*Digatalis purpurea**	Scrophulariaceae
Ivy-leaved speedwell	*Veronica hederifolia**	Scrophulariaceae
Moth mullein	*Verbascum blattaria**	Scrophulariaceae
Bittersweet nightshade	*Solanum dulcamara**	Solanaceae

Demographics, Land Use (e.g. how the land is being utilized) and Growth Potential

It has been recognized that land use and human activities are the primary driver of habitat loss, introduction of exotic species, environmental degradation, and increased runoff and pollutants. These effects are exacerbated in urbanizing landscapes such as Pierce and King Counties where changes are both rapid and permanent. As such, a discussion of the current land use trends within the Lower White River BMA is essential to understanding impacts to the feasibility of retaining biodiversity within this area.

Existing Land Use and Population - Pierce

Currently there are 94 individual properties (tax parcels) located within the Lower White River BMA and according to year 2000 census data approximately 302 people live within the BMA. Land use on the Pierce County side of this BMA is predominately for utilities (Puget Sound Energy - 23%). The rest of the breakdown is parks/open space (9%), industrial (5%), low density single-family residential (3%), natural resources (3%) and commercial (.4%). Approximately 30% of the BMA is vacant land (i.e., no building on the parcel), 18% water bodies, and 8% classified as unknown. The remaining 48% are lands within King County. (See Figure 9 for Existing Land Use Map)

Existing Land Use and Population - King

The properties along the White River in unincorporated King County in and adjacent to the BMA are nearly all owned by Puget Sound Energy and all in riparian/floodplain forest (Table 5). Land use on the King County side of this BMA is predominately low density single-family residential (6%) and parks (5%) with a small amount of industrial (3%). Approximately ½ of the BMA (52%) is vacant land. See Figure 10 for Existing Land Use Map.

Table 5. Land Ownership in the Lower White River BMA within King County's jurisdiction.

Land Owner	**Acres within BMA**
King County	5.4
State of Washington-DNR	2.1
Puget Sound Energy	60.1
Other Private Ownership	15.3
Total	82.9

Table 6 provides a breakdown of existing land use on these parcels by categories such as residential, commercial, industrial, civic, and vacant lands. Note that the figures for King County are for geographic King County, meaning that they are not all in King County government's jurisdiction.

TABLE 6 – EXISTING LAND USES IN THE LOWER WHITE RIVER BMA					
Land Use	**Acreage (Pierce/King)**		**Total Parcels**		**% of the BMA**
Single-Family	19.76	30.18	10	103	3.13%
Mobile Homes	6.70	17.04	6	23	1.49%
Total Residential	**26.46**	**47.22**	**16**	**126**	**4.62%**
Commercial	**3.20**	**-**	**5**	**-**	**0.20%**
Industrial	**41.05**	**26.03**	**14**	**1**	**4.21%**
Communication/Utility	**194.40**	**60.1**	**15**	**2**	**15.97%**
Education (includes schools)	**-**	**7.91**	**-**	**1**	**0.50%**
Public & Quasi-Public Facility (churches)	**-**	**7.73**	**-**	**1**	**0.49%**
Parks, Open Space, Recreation	**74.26**	**34.43**	**9**	**3**	**6.82%**
Natural Resource					
Mining/Quarry/Ore	-	2.84	-	3	0.18%
Forestry	24.91	-	5	-	1.56%
Agriculture	-	0.05	-	1	
Total Natural Resource	**24.91**	**2.89**	**5**	**4**	**1.74%**
Vacant	**252.22**		**30**		**41.05%**
Vacant Single Family		328.75		68	20.63%
Vacant Multi-Family		3.92		4	0.25%
Vacant Commercial		69.10		4	4.34%
Vacant Industrial		0.01		1	
River/Creek/Stream*	**155.07**	**.97**	**12**	**1**	**9.79%**
Unknown/Other jurisdictions	**69.39**	**170.92**	**-**	**-**	**15.09%**
TOTAL LOWER WHITE RIVER AREA	**1,593.27**				**100%**

* Rivers are considered waters of the state and are not put into parcels. The acreage of Water is higher, but these numbers represent the amount of area in the BMA based within legal parcels.

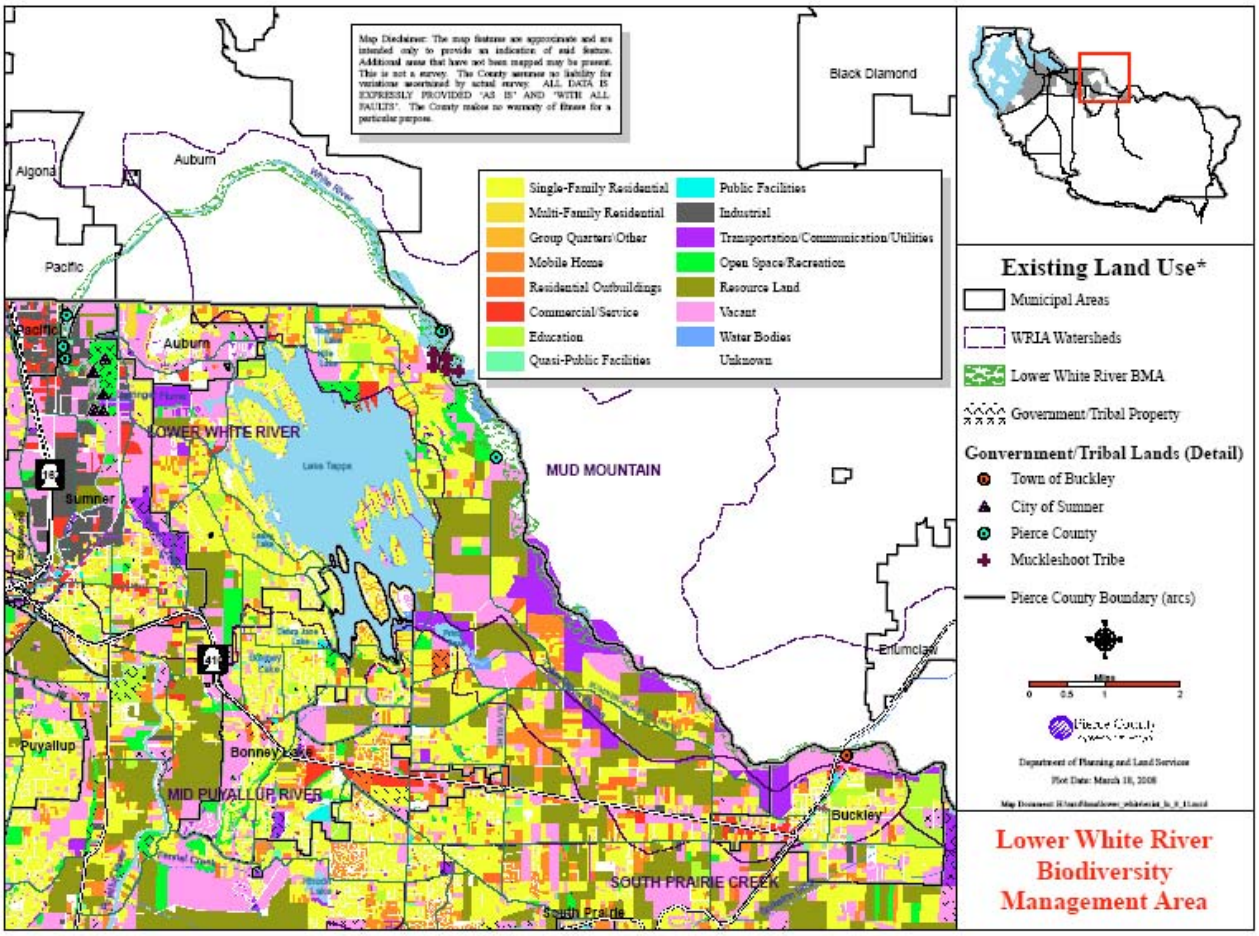


Figure 9 – Existing Land Use Pierce County

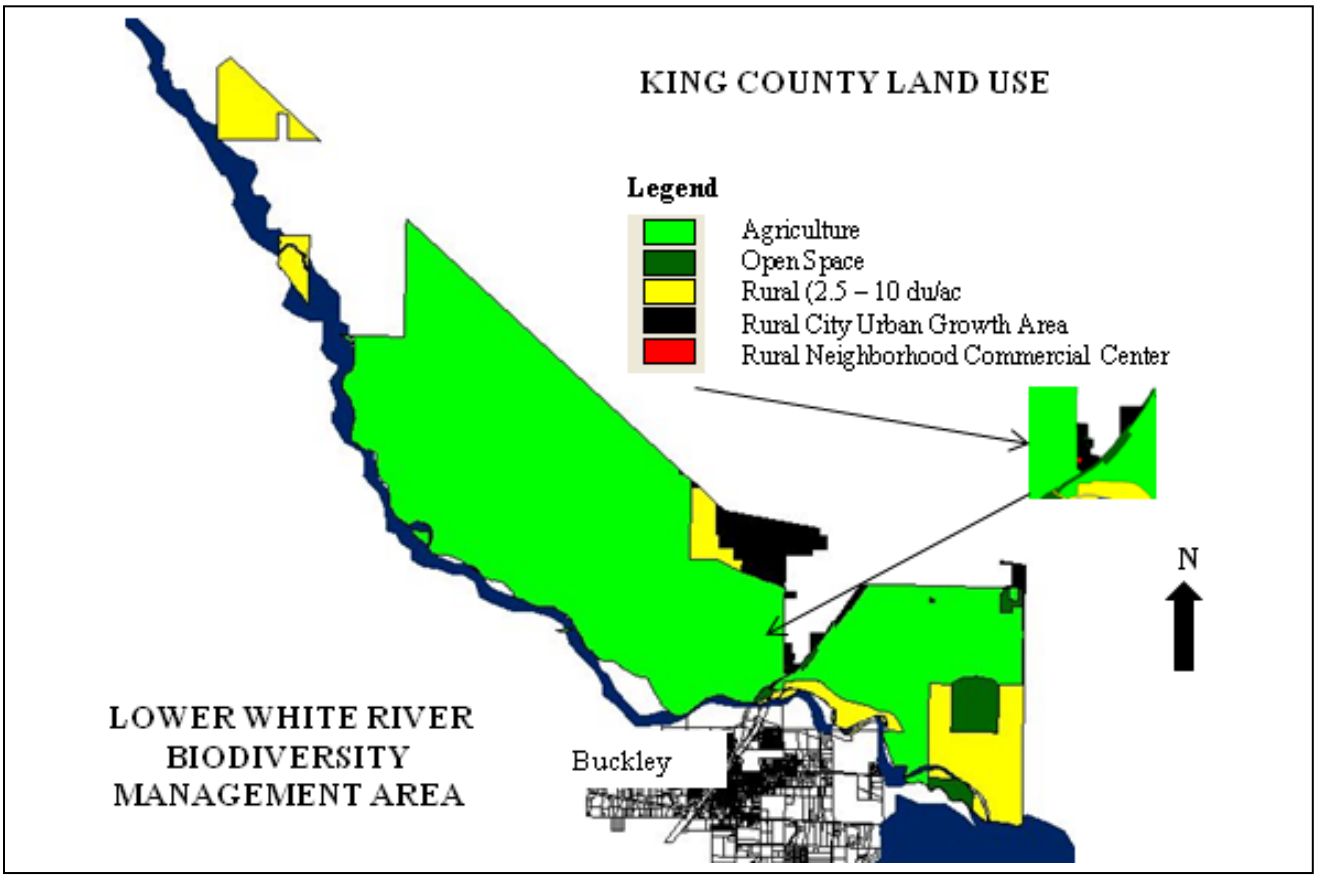


Figure 10 Existing Land Use – King County

There are fifteen properties located within or partially within the BMA that are publicly owned by local, state, and tribal governments. The Muckleshoot Tribe owns five properties containing 66 acres. Pierce County owns approximately 40 acres of land on five parcels of land. The City of Pacific owns 26 acres within their City Park. Buckley owns one property, 0.17 acres in size. The City of Sumner owns six parcels for a total of 9 acres. Table 7 provides a breakdown of publicly owned lands within the Lower White River BMA in Pierce County.

There are twenty-three properties located within or partially within the BMA within geographic King County that are publicly owned (Table 8). Of these, only 3 properties owned by King County totaling approximately 16 acres are within King County's jurisdiction.

Current Zoning and Shoreline Environments

Zoning

On the Pierce County side, very small portions of the Lower White River BMA are located within Pacific (14 acres), Sumner (78 acres), and Buckley (69 acres) and the remaining area is located in unincorporated Pierce County. Within unincorporated Pierce County, the BMA is predominately zoned Rural 10 (R10) and Employment Centers (EC). A small portion of a parcel is zoned Agricultural Resource Land (ARL). (See Figure 11 – Zoning Map) The Rural 10 zone allows for densities of 1 dwelling unit (du) per 10 acres with a bonus density of 2 du/10 acres when 50% of the property is set aside as permanent open space.

Lot sizes within the R10 zone must be a minimum of 1 acre in size. Employment Centers allow a wide variety of industrial uses with some limited commercial uses. The ARL is a resource lands zone that allows densities of 1 du/10 acres with minimum lot sizes of 10 acres. Table 9 provides a breakdown of the zones that apply within the BMA.

Lands in the BMA, as it is currently drawn, in *unincorporated* King County (and outside the Muckleshoot Indian Reservation) are within either the Agriculture Production District (APD) or are in RA-10 zoning (Table 10). The zoning in the APD is A-35: Agricultural, one dwelling unit per 35 acres. The zoning in RA-10 has a 10-acre minimum parcel size, except for smaller parcels that were already established when zoning was established.

TABLE 7 – LOWER WHITE RIVER BMA PUBLIC LANDS (PIERCE & KING COUNTY)				
Parcel Number	**Total Area**		**Area Within BMA Only**	
	# Parcels	**Acres**	**# Parcels**	**Acres**
Pierce County				
0520022011	1	12.40	1	12.29
0520123001	1	9.70	1	0.11
0420012003	1	25.98	1	25.29
0420013047	1	8.16	1	2.37
4495400422	1	2.52	1	0.42
Total Pierce County	**5**	**58.76**	**5**	**40.48**
City of Buckley				
0620344004	1	0.83	1	0.17
Total City of Buckley	**1**	**0.83**	**1**	**0.17**
City of Sumner				
0420121012	1	1.01	1	0.61
0420014059	1	10.89	1	7.24
0420014058	1	104.86	1	0.05
0420121003	1	5.25	1	0.29
0420121011	1	4.74	1	0.96
0420121010	1	9.84	1	0.06
Total City of Sumner	**6**	**136.59**	**6**	**9.21**
Muckleshoot Tribe				
0520023008	1	39.32	1	36.94
0520023012	1	3.20	1	0.13
0520023010	1	10.37	1	10.01
0520023002	1	16.16	1	6.80
0520024000	1	19.17	1	12.41
Total Muckleshoot Tribe	**5**	**88.22**	**5**	**66.29**
City of Pacific (King)				
3621049077	1	26.40	1	26.40
Total City of Pacific	**1**	**26.40**	**1**	**26.40**
TOTAL	**18**	**310.80**	**18**	**142.55**

Table 8. Lower White River BMA Public Lands within Geographic King County.

Public Agency	**Acres within BMA**
King County	251.3
City of Auburn	210.1
City of Pacific	2.2
United States-BIA	36.9
Grand Total	500.6

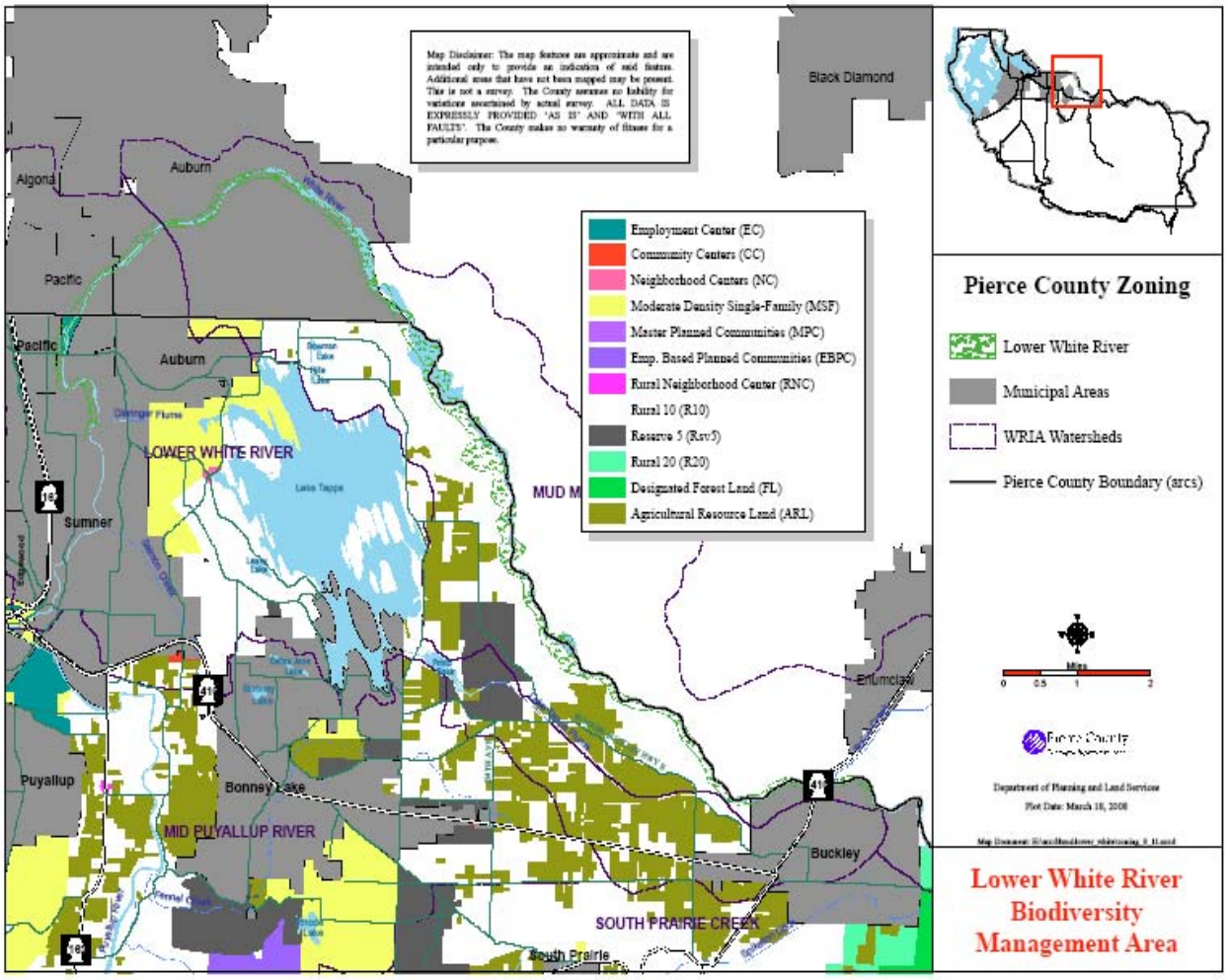


Figure 11. Pierce County Zoning Map

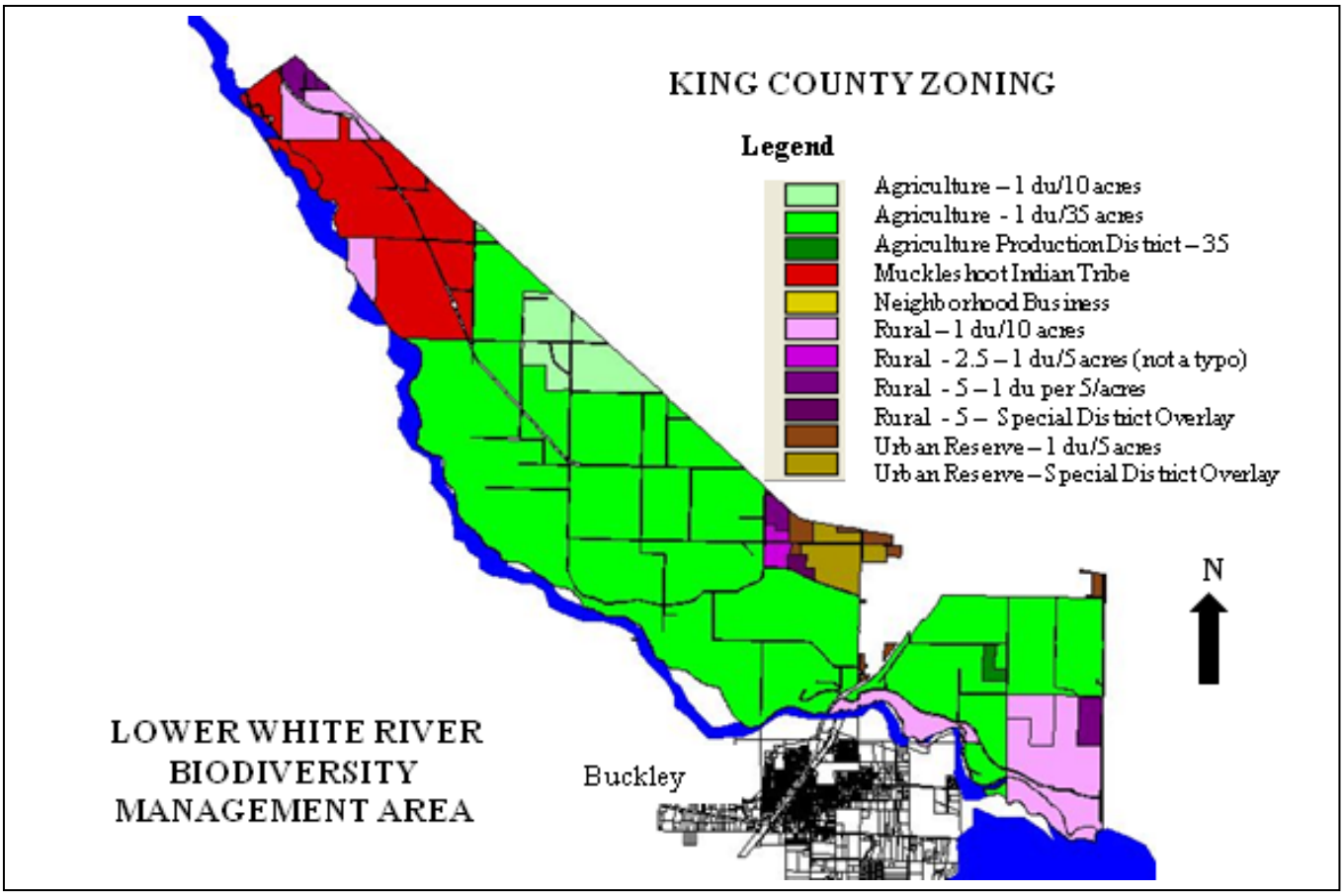


Figure 12. King County Zoning Map

TABLE 9 - PIERCE COUNTY ZONING CLASSIFICATIONS WITHIN THE LOWER WHITE RIVER BMA		
Zones	**Acreage**	**Percent of BMA**
Urban Zones (unincorporated Pierce County)		
EC	33.00	3.51%
Total Urban	**33.00**	**3.51%**
Rural Zones		
R10	747.14	79.37%
Total Rural	**747.14**	**79.37%**
Natural Resource Zones		
ARL	0.04	0.00%
Total Natural Resource	**0.04**	**0.00%**
Total Pierce County Unincorporated	**780.18**	**82.88%**
Pierce County Incorporated		
City of Buckley	69.46	7.38%
City of Pacific	13.80	1.46%
City of Sumner	77.95	8.28%
Total Pierce County Incorporated	**161.21**	**17.12%**
TOTAL PIERCE COUNTY	**941.39**	**100%**

Table 10. Zoning Classifications within the Lower White River BMA in Geographic King County.

Zoning Classification	Acres in BMA
A-35 (Agricultural Production District)	109.57
RA-10 (Rural, 10-acre minimum parcel size)	83.17
MIT (Muckleshoot Reservation; their zoning applies)	175.02
Grand Total	367.76

Shoreline Environments

The Washington State Shoreline Management Act (SMA) provides for the management of water bodies or watercourses identified as "Shorelines of the State." Areas under jurisdiction of the SMA include water courses with a mean annual flow of 20 cubic feet per second (cfs), lakes greater than 20 acres in size and the shorelines of Puget Sound. All lands within 200 feet of the ordinary high water mark, and associated wetlands and floodplains, fall within the jurisdiction of Shorelines of the State. The Pierce County Shoreline Management Program (SMP) and companion Shoreline Management Regulations (SMRs) designate Shorelines of the State into five types of environments including Urban, Residential Rural, Rural, Conservancy, and Natural. These environments are similar to zoning designations allowing different land uses, densities and activities ranging from the most intensive uses (Urban) to very limited uses (Natural).

The White River is considered a Shoreline of the State. The majority of the shorelines within the BMA are classified as Rural, Urban, and Conservancy. The classification of Rural shoreline in Pacific and Buckley, allows for areas which are presently used for intensive agricultural and recreation purposes or for those areas having the potential of supporting intensive agricultural and recreational development. This classification is intended to protect agricultural land from urban expansion, restrict intensive development along undeveloped shorelines, and encourage preservation of open spaces. A small section at the west tip of the BMA in Sumner is classified as Urban. Urban shorelines are areas of high intensity land use including residential, commercial and industrial development. These areas are presently subjected to intensive use pressure as well as those areas planned to accommodate urban expansion. Most of the river from the Muckleshoot tribe south towards Buckley is classified as Conservancy Environment, which allows for low density residential, outdoor recreation and low intensity agricultural and forestry uses. (See Figure 13 -Shorelines Environment Map).

The shoreline in this area within King County is designated as either Natural or Rural shoreline in the current (2004) Shoreline Management Master Program. However, shorelines were re-designated during an update of the program during 2007-2008, and the new Shoreline Master Program designations await King County Council approval. In the Draft Shoreline Master Program (2008), King County shorelines along the White River in this area are designated Resource Shoreline because they are within the Agricultural Production District. A small area outside the APD are designated Conservancy Shoreline. According to the draft code, the Resource shoreline designation is applied to allow for mining and agricultural uses on lands that have been designated under the Growth Management Act as agricultural land of long-term commercial significance or mineral resource lands. The Conservancy designation is applied to protect and conserve the shoreline for ecological, public safety, and recreation, purposes. It includes areas with important ecological processes and functions, valuable historic and cultural features, flood and geological hazards, agricultural and mineral resource lands, and recreational opportunities. Residential areas can be designated as conservancy shorelines. (See Figure 14 – Shorelines Management Map).

Open Space Corridors

Pierce County identifies land areas most desirable for open space purposes (See Figure 15 - Open Space Corridors Map). These areas represent the highest priority for lands for conservation including creeks, wetlands, and fish and wildlife habitat areas. The Lower White River BMA is included within the County's Open Space Corridor map because of its status as a biodiversity management area and because of the White River. Identified open space corridor areas may be used as the basis for application of special zoning that provides for greater environmental protection and less density. For example, Pierce County has applied a Rural Sensitive Resource (RSR) in rural areas (i.e. at least 50% of a parcel must fall within the open space corridor) and a Residential Resource (RR) in urban areas. In addition, extra points under Pierce County's Current Use Assessment and Conservation Futures Programs are awarded to

properties located within the open space corridor. All of these new environmentally sensitive zones were created as a result of the BMA work.

Future Growth Potential

Figure 16 – Potential Development Map indicates the parcels of land located within the Lower White River BMA that have a potential to subdivide and create additional lots. Each of these parcels is represented with an ID number. Table 8 provides a list of these parcels and indicates the parcel acreage, the potential total lots and the potential additional number of lots that may be possible given the Rural 10 zones provision for a maximum of two dwelling units per 10 acres if 50% of the property is set aside as open space. Given the County's provision for rounding up to the next whole number for anything greater than .5 any parcel of land greater than 7.5 acres would be able to subdivide. Of the 37 parcels of land within the Lower White River BMA, there are currently 33 parcels that could be subdivided with no bonus density for a potential total of 275 additional new lots. If landowners used the bonus density, those parcels could be subdivided for a potential total of 308 additional new lots. There could be additional development potential within the incorporated cities given what their zoning is and what the development provisions are for those zones.

Each of these lots could support a new residential home and associated driveways and accessory structures and all run along the river between Auburn and Buckley on the Pierce County side. Of the White River Basin, the Lower White River sub-basin has the highest percentage (14%) of impervious surface with a projected increase to 20% future land use converting open space to residential and commercial uses. This projected increase would be with the potential new lots within the Lower White River BMA.

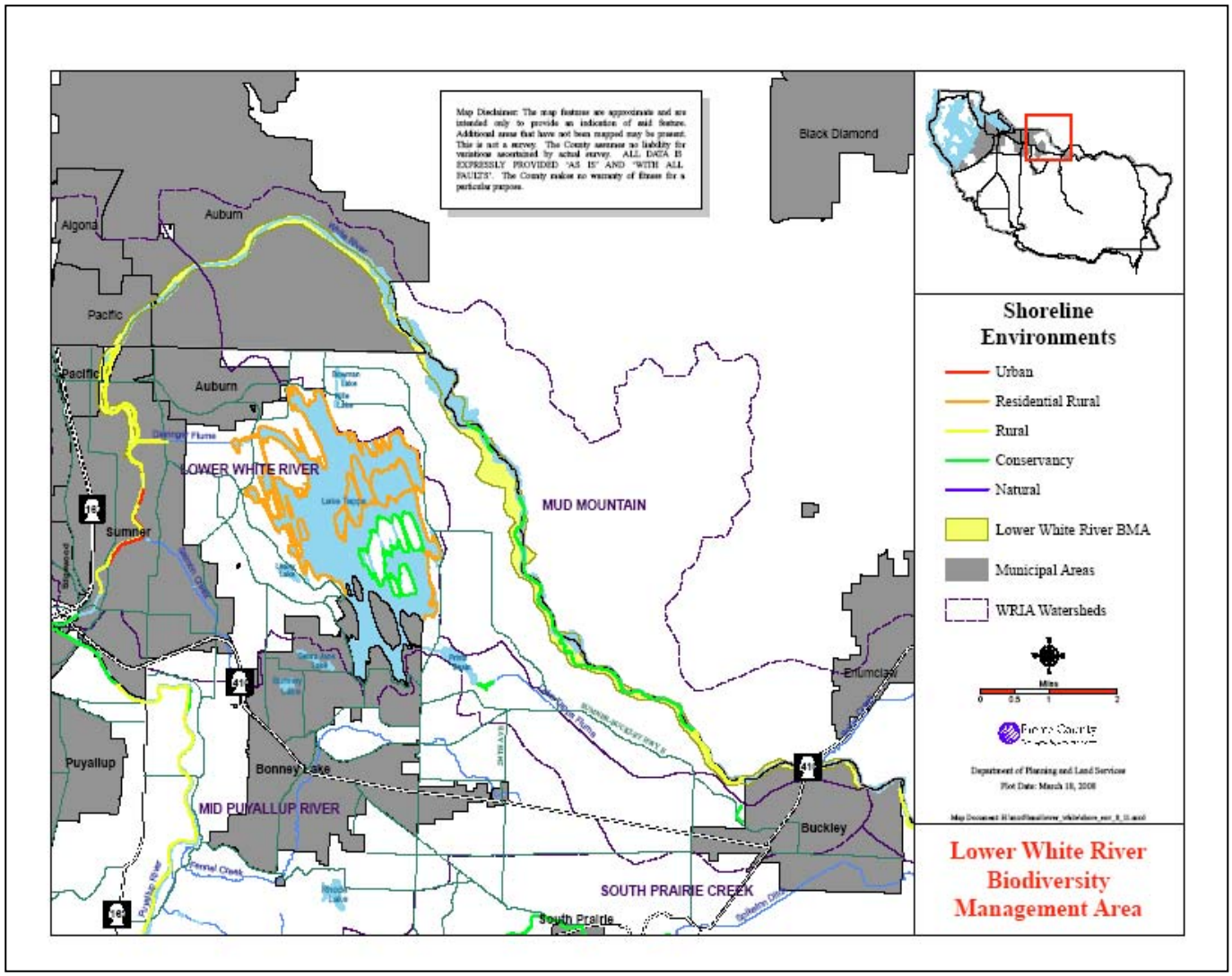


Figure 13. Shoreline Map – Pierce County

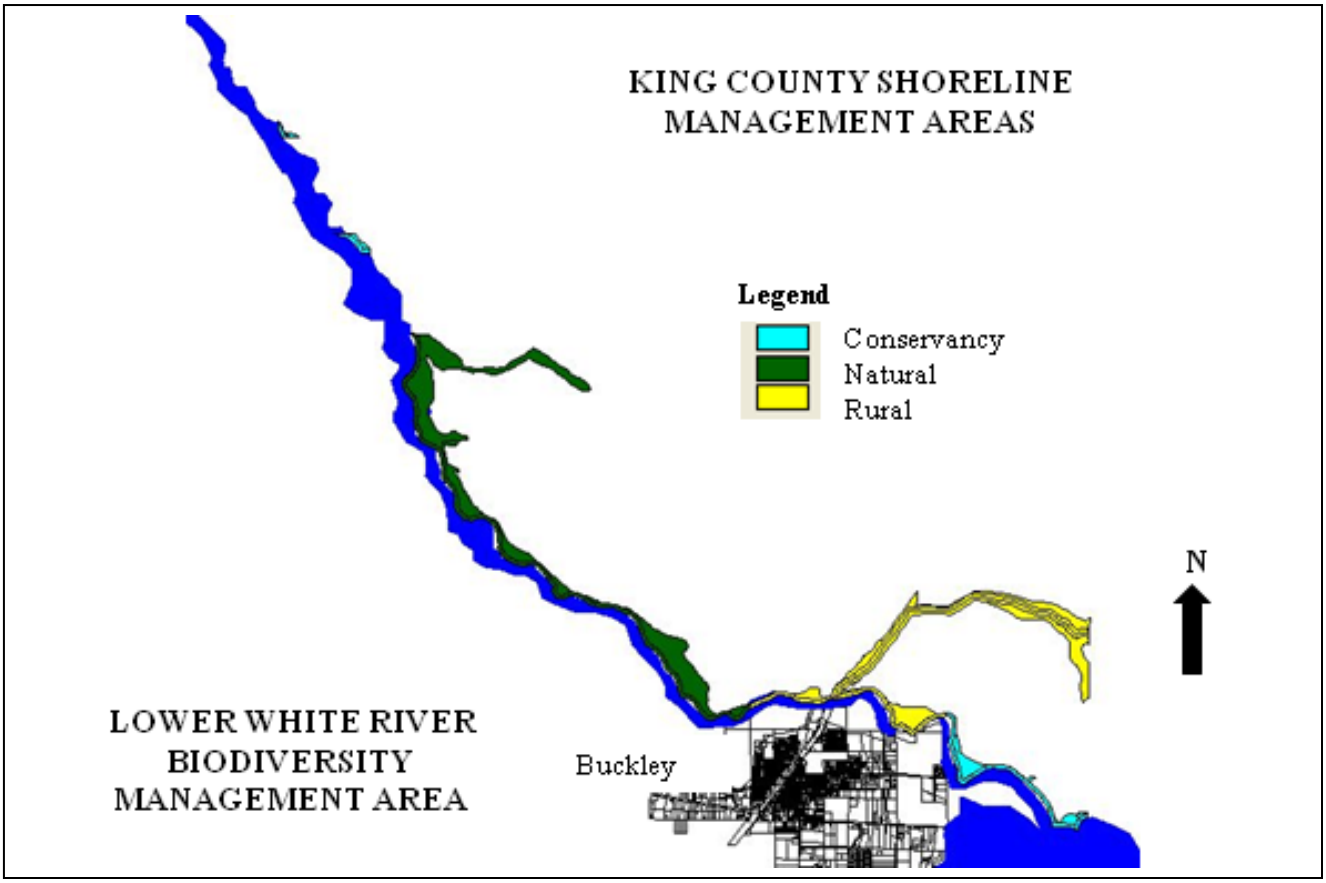


Figure 14. Shoreline Map – King County

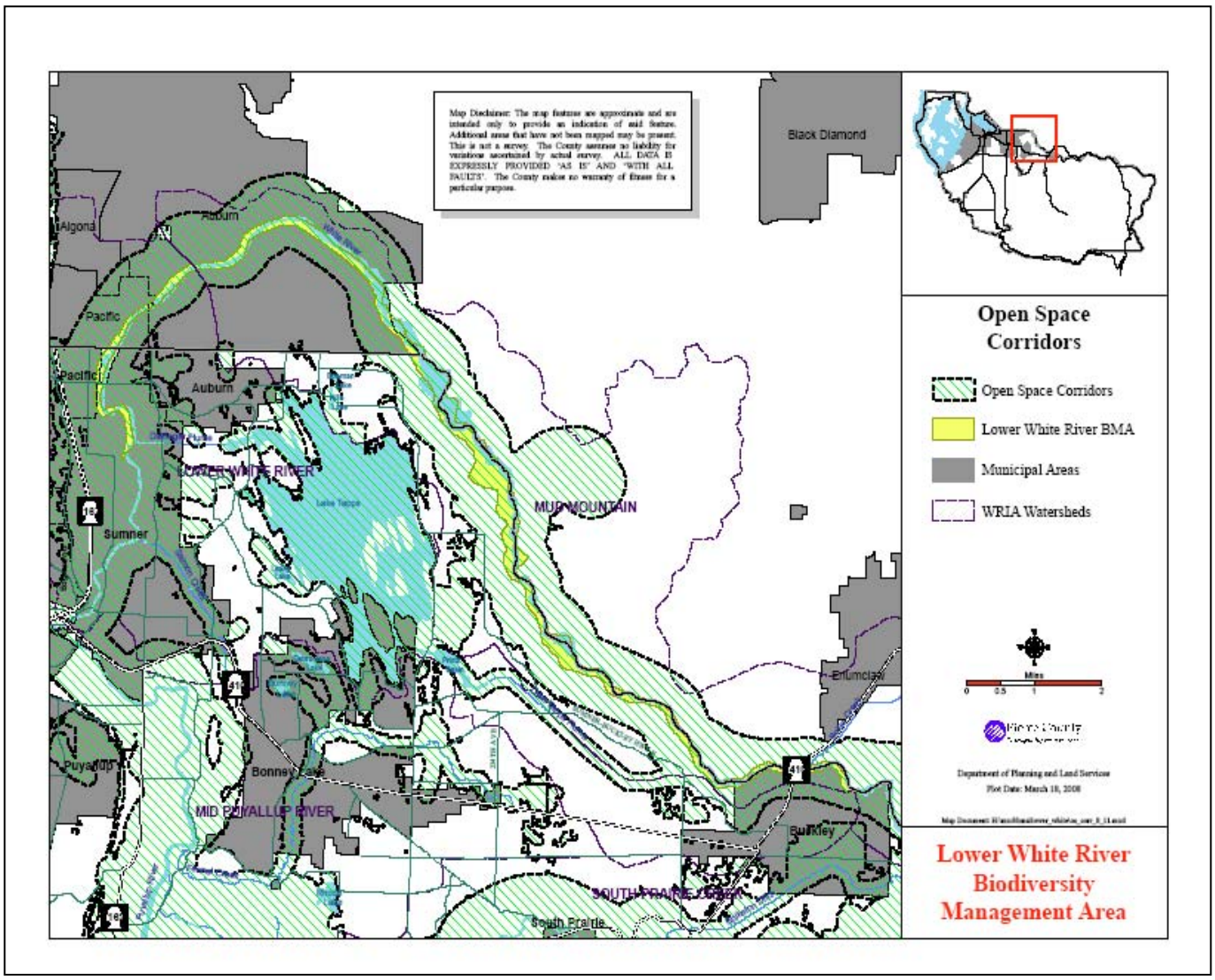


Figure 15. Open Space Corridor Map

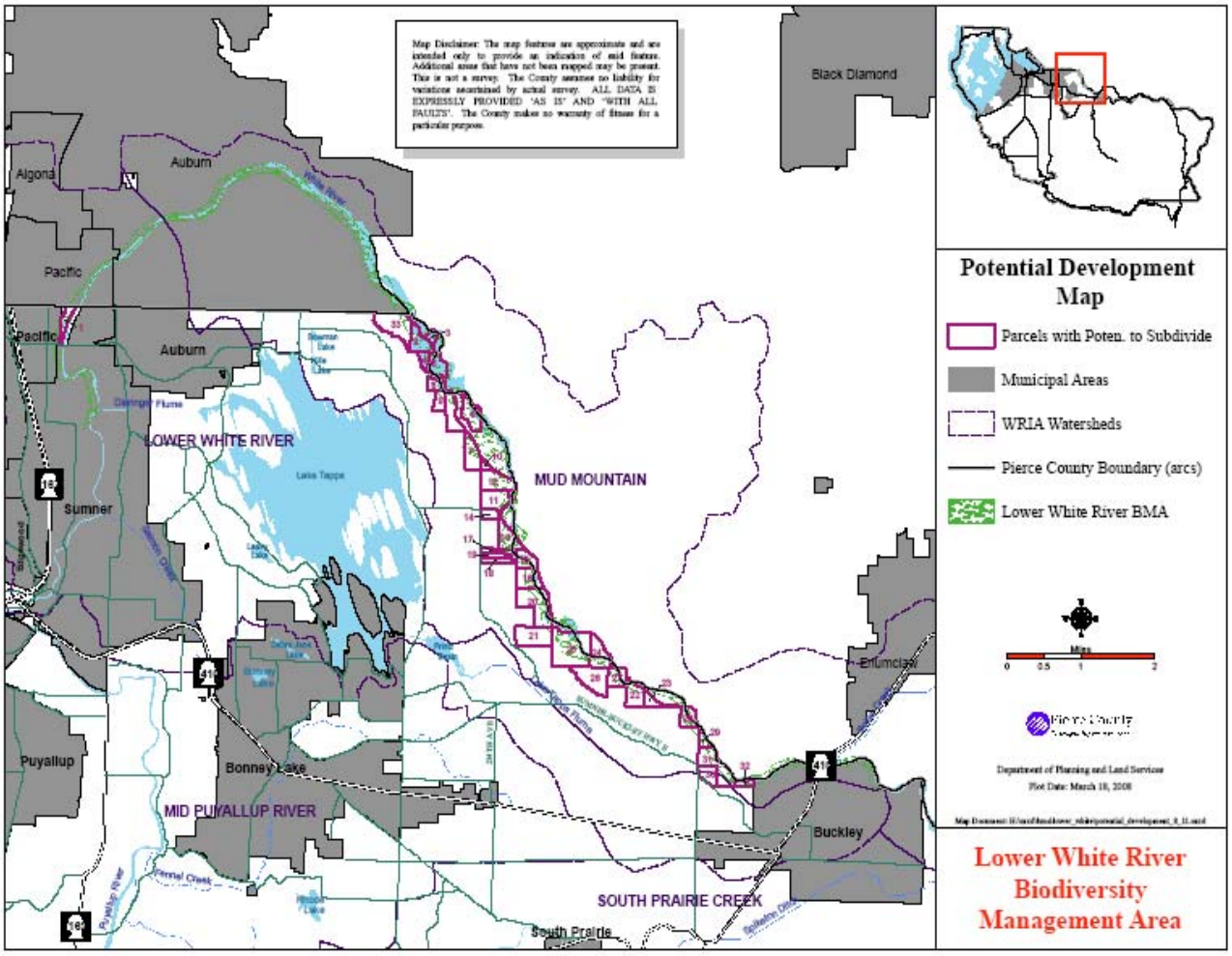


Figure 16. Potential Development Map – Pierce County

TABLE 11 – DEVELOPMENT POTENTIAL WITHIN LOWER WHITE RIVER BMA (PIERCE COUNTY UNINCORPORATED)				
Map ID #	**Parcel #**	**Acreage**	**Potential # of Total Lots[1]**	**Potential # of Additional Lots**
1	0420012003	25.20	5	4
2	0520022001	38.00	7	7
3	0520022011	10.78	2	1
4	0520023002	14.00	2	1
5	0520023007	17.50	3	2
6	0520023008	23.95	4	3
7	0520111000	115.85	23	22
8	0520111001	34.75	6	5
9	0520112012	25.75	5	4
10	0520123001	10.00	2	1
11	0520132000	58.90	11	10
12	0520132002	61.70	12	11
13	0520133000	51.30	10	9
14	0520133004	20.00	4	3
15	0520241000	32.90	6	5
16	0520241001	54.00	10	9
17	0520242021	20.00	4	3
18	0520242022	20.00	4	3
19	0520242023	20.00	4	3
20	0520244000	108.95	21	20
21	0520251001	80.20	16	15
22	0620293000	57.92	11	10
23	0620293001	20.00	4	3
24	0620301000	35.00	7	6
25	0620302000	127.80	25	24
26	0620303001	85.25	17	16
27	0620304000	40.00	8	7
28	0620321001	25.00	5	4
29	0620332000	45.00	9	8
30	0620333001	30.00	6	5
31	0620333002	120.00	24	23
32	0620334000	65.00	13	12
33	7001480280	90.32	18	17
TOTALS		**1,585.02**	**308**	**275**
1 – The number of total lots is based on maximum development potential in cases where the property owner utilizes the bonus density of 2 dwelling units per 10 acres with 50% of the parcel set aside as open space.				

Because of the zoning in this area, only five parcels that intersect the BMA in unincorporated King County (and outside the MIT Reservation) would potentially be able to be subdivided (Table 12).

Table 12. Development Potential within Lower White River BMA (King County Unincorporated).

PIN	Zoning	Present Use	Acres	No. possible lots
1120059001	RA10	Vacant(Single-family)	41.75	4
2420059001	A35	Vacant(Single-family)	71.54	2
1120059002	RA10	Vacant(Single-family)	34.75	3
3520069024	RA10	Farm	35.26	3
2420059002	A35	Vacant(Single-family)	71.64	2

Impacts of Growth and Development on Habitat and Species Presence

Future growth potential on the lands in unincorporated King County is somewhat limited by regulatory protections offered to critical areas present within the BMA. The entire BMA in King County is within a Critical Aquifer Recharge Area (CARA) and a seismic hazard area, and much of it is within an erosion hazard area. Portions of the BMA that are along the valley wall are within the slide hazard area. The BMA is also located within the 100-year floodplain of the White River.

The Lower White River BMA will only remain rich in species diversity if care is given to maintaining large enough habitat areas for species viability and good quality habitat conditions, including corridors for safe movement between primary and seasonal habitats. Stressors to habitat include a variety of factors such as:

- Fragmentation in habitat below the threshold for species viability due to land development, removal of vegetation, and roads
- Actions that change the hydrology within the watershed and specifically within the floodplain which especially affects amphibians, fish species, and wetland plant species
- Species mortality caused by vehicular traffic on roads and predation by non-native animals (cats, dogs, bullfrogs, non-native fish, etc.)
- Conversion of native vegetation to non-native and invasive plant species
- And other human actions that cause species mortality or negatively impact habitat, such as water or air quality changes.

Stressors to the Lower White River BMA are discussed in greater detail in Chapter III. In addition, the fate of the Puget Sound Energy (PSE) properties along the White River (totaling 2,500 acres) will play a critical role for the long-term protection of biodiversity within the Lower White River BMA. Negotiations between PSE and the Cascade Land Conservancy and other parties are ongoing to preserve this land. Most of the PSE properties were inventoried in the 2006 LWR Bioblitz. A report was prepared for the Cascade Land Conservancy identifying which parcels had the greatest potential for long-term conservation.

Chapter III - Conservation Targets and Threats

Overview of Conservation Targets and Threats

At a landscape level, conservation targets (systems) may include ecological systems, ecological communities, species, and other important natural resources. Ecological systems share common ecological processes (e.g. hydrology), environmental features (e.g. soil types), or environmental conditions (e.g. precipitation). Ecological communities have common or co-occurring features such as species or natural vegetation types. Other important factors in determining conservation targets include groundwater recharge, forest reserves, etc.[13]

Each conservation target has key ecological attributes that ensure the proper functioning of that system's occurrence in a landscape over the long-term. Key ecological attributes consist of size, condition (i.e. measure of the composition, structure and biotic interactions that characterize the occurrence), ecological processes (e.g. hydrologic regimes, fire regimes and other natural disturbances) and connectivity of target species to habitats and resources including dispersal or migration routes.

In an ideal situation, intact and properly functioning conservation targets are not significantly stressed. Stresses to a conservation target result in degradation and impairment of key ecological attributes and occur in a variety of ways from human impacts and other natural factors. The source(s) of the problem is what causes the stress to occur. Collectively, stresses and sources of stress are referred to as threats to the system.

In the Lower White River BMA several conservation targets were selected to represent the key ecological functions occurring throughout the area. These conservation targets include

- Lower White River
- Tributaries, wetlands, and oxbows
- Conifer/deciduous mixed forest areas.

Each of these conservation targets provides the systems that collectively create the rich variety of habitats necessary to foster a high level of biodiversity in that BMA. A detailed description of each conservation target and the threats to these systems follows. Conservation strategies to abate these threats are discussed in Chapter IV.

Lower White River

General Description of the Lower White River

The Lower White River riparian corridor is dominated by riparian habitat, with an overstory of hardwood and hardwood/conifer trees. The BMA begins north of Sumner, passes through an area recently restored by Pierce County, and continues northwards through the cities of Pacific and Auburn. Riverfront property just north of Pacific City Park in Auburn (east end of 3rd Ave SE) has resulted in some removal of native

[13] The concept of identification of conservation targets and key ecological attributes, threats (stresses and sources of stress), and threat abatement strategies (referred to here as "conservation strategies" to abate threats) is derived from The Nature Conservancy (TNC) 5-S conservation action planning methodology. However, this method has been adapted to acknowledge the fact that the BMA was already identified utilizing the GAP methodology and as such the conservation targets were selected based on review of the key ecological attributes within the BMA.

riparian vegetation. The dominant hardwood forest along this stretch of the river consists of willows, red alder, black cottonwood, black hawthorn, bigleaf maple, and Pacific dogwood. The BMA then continues through Auburn Game Farm Wilderness Park; an area dominated by native vegetation with a mix of hardwood and conifer trees with western hemlock, western redcedar, and Douglas fir the dominant conifers. Hazelnut, salmonberry, red elderberry, red osier dogwood, and invasive Himalayan and evergreen blackberries are the dominant shrubs. One small section of the White River Trail System, near the riverfront has also had native vegetation removed. Stuck River Drive may also impede movement of some species; however, this is a minor road with little traffic. As the BMA continues eastward through Muckleshoot Indian Reservation and into eastern Pierce County, it continues to be dominated by riparian, deciduous/conifer vegetation in a non-fragmented arrangement (e.g. mostly undeveloped).

Water Quality of White River

Water quality was analyzed at 5 sites in 2005-2006 as part of the White River Basin Plan effort. Two gaging stations, one at Salmon Springs in Sumner and Stream 51 near Bonney Lake collected flow data over the same time frame. Neither the water quality sampling sites or gaging stations were within the LWR BMA. The White River mainstem was surveyed by URS Consultants in the fall of 2004. Reach observations were summarized by reach lengths, physical features and overall aquatic and riparian conditions. Reach observations that fell within or near the LWR BMA are included with the individual jurisdictional breakout in this plan.

The Basin Plan ranked and prioritized stream reaches and selected 73 sites. Riparian integrity is considered high if >70% of the corridor has an intact riparian zone wider than 100 ft, and <10% of the corridor is <35 ft, and there are <3 breaks (road crossings) in the corridor per stream mile. Streams meeting these conditions have greater potential for maintaining natural ecological functions. The Plan indicates that:

- 4% of the White River riparian corridor is in good condition,
- 59% is in fair condition, and
- 37% is in poor condition.

Of the 21 sites sampled within the LWR BMA,

- 5% were in good condition,
- 86% in fair condition, and
- 10% were in poor condition.

The Ecosystems Diagnosis and Treatment (EDT) model rates the quality, quantity, and diversity of habitat along a stream relative to the needs of fish such as Coho or Chinook salmon. The method describes how the fish would rate conditions in a stream based on current scientific understanding of their needs. Aquatic habitat EDT rankings indicated 16% is in good condition, 37% in fair condition, and 47% in poor condition. Within the BMA, 33% of aquatic habitat is in good condition, 43% aquatic habitat is in fair condition, and 24% aquatic habitat is in poor condition.

Development Along the River

Puget Sound Energy and Mud Dam have restricted or prohibited development along the White River, which has contributed to the continued biodiversity of this important riparian corridor and its designation as ecoregionally significant[14].

[14] Flobert, J., M. Goering, G. Wilhere, C. MacDonald, C. Chappell, C. Rumsey, Z. Ferdana, A. Holt, P. Skidmore, T. Horsman, E. Alverson, C. Tanner, M. Bryer, P. Iachetti, A. Harcombe, B. McDonald, T. Cook, M. Summers, D. Rolph. 2004. Willamette Valley-Puget Trough-Georgia Basin Ecoregional Assessment, Volume One: Report. Prepared by The Nature Conservancy with support from The Nature Conservancy of Canada, Washington Department of Fish and Wildlife, Washington Department of Natural Resources (Natural Heritage and Nearshore Habitat programs), Oregon State Natural Heritage Information Center and the British Columbia Conservation Data Centre.

Tributaries, Wetlands and Oxbows

The Lower White River watershed is a complex hydrologic system with wetlands and multiple tributaries feeding into this wetland/riparian system from the Upper White River. The wetland and riparian systems provide a rich habitat for a variety of fish, reptiles, amphibians, mammals and bird species. Certain wildlife species, such as pond breeding amphibians, are very dependent on the hydrology of an area for their life cycle needs.

Private homes, farms, and light industry are located near the tributaries and the condition of the streams depends to a large extent on how individual developers and owners have treated the riparian corridor, which in most cases has resulted in poor to fair condition.

Wetlands filter excess nutrients, chemicals and sediments from excess runoff. They help keep groundwater clean, store flood waters and provide habitat for aquatic species and wildlife who use the water. Wetlands may dry up in the summer or they may be saturated year round. Wetlands generally support plants adapted to wet areas but are able to tolerate dry spells.

Oxbows, plus buffer zones can be useful and environmentally sound measures of flood control. Other flood control measures may have a detrimental effect on salmon habitat, specifically dikes that impair connections between rivers and their flood plains, which would normally supply large woody debris, fine organic matter and dissolved nutrients to the drainage network. Oxbows retain those characteristics that are important habitat elements, providing refuge and food sources for the riverine community. Re-channeling or braiding of the streams may be necessary to restore oxbows.

King County has allocated Capital Improvement funds for the White River flood damage repair at Stuck River Drive. Both King Floodplain management and Pierce County Surface Water Management have purchased land along the BMA between Pacific and Auburn for the purpose of flood control. Pierce County has analyzed the feasibility of levee setbacks and the White River at 6 locations between RM 2.6 and 5.1.

Riparian habitat or buffer zones along the river can contribute many attributes to the river it abuts. Shade to cool the water, organic and woody debris provides nutrients to river inhabitants. Vegetation roots protect and stabilize the banks, providing shelter and habitat. The riparian zone contributes to a high water table, increased storage capacity and higher late summer stream flows. Lawns, agricultural areas adjacent to the river, non-native vegetation and impervious surfaces contribute none of these things and indeed degrade the quality and quantity of the river itself.

Forest – Conifer/Deciduous Mixed Forest

The Lower White River BMA contains a patchwork of mixed lowland conifer/deciduous forest, punctuated with wetlands, riparian areas, pastures, areas developed for single family residential and commercial uses. Along the adjacent lands the forest cover transitions to a conifer/deciduous forest habitat. The Muckleshoot Tribe and Puget Sound Energy have left much of the forest surrounding the river intact. Forested areas provide connectivity between the different habitat patches and also serve to maintain hydrologic cycles within a watershed. Best available science indicates that 65% forest cover within an urban watershed provides high quality hydrological function for wetland water level fluctuation

and stream hydrology[15]. The Lower White River BMA currently has at least 65% forest cover and more if the riparian areas along the floodplain are included. These forest areas are a necessary component in many terrestrial species lifecycles. Each species has their own unique needs for habitat patch size, which increases for mammals and birds with a sensitivity to patch size. This is very important for pond-breeding amphibians, and native fish species that utilize the stream, wetland, and lake systems in the watershed and BMA. It will be crucial to work with each jurisdiction to maintain or increase forest cover.

[15] Booth, D.B., 2000. Forest Cover, Impervious-Surface Area, and the Mitigation of Urbanization Impacts in King County, Washington, Prepared for King County Water and Land Resources Division.

Threats to Conservation Targets

The main threats that are or may potentially be occurring to conservation targets include:

- Habitat conversion and fragmentation due to development, removal of native vegetation and roads, specifically potential development of the Puget Sound Energy properties.
- Poor water quality caused by residential use of fertilizers, domestic animal waste, septic tank leakage, spraying of herbicides along public roads, and road runoff
- Loss of pools, large woody debris (LWD), and riparian vegetation due to development and channelization of the river.
- Introduction of invasive, exotic, non-native species including plant species, wildlife species (e.g. bullfrogs, Japanese knotweed)
- Fish passage blockage from culverts.
- Wildlife movement blockages from roads, driveways and fencing
- Erosion and damage of riparian habitat from dikes/levees along City's of Buckley, Pacific, and Sumner
- Predation of native species by domestic cats and dogs
- Water fluctuations due to storm drains redirecting water flow into the river and not into wetlands, dikes, and stormwater from development
- Pollution caused by dumping of trash and debris into or near the river
- Non-permitted illegal discharge dumped directly into the river

Chapter IV - Conservation Strategies

Overview of Conservation Strategies

To achieve long-term health of a conservation target, threats must be abated to ensure viable, functioning systems. There are two approaches to lessen the stress and enhance or maintain the viability of the conservation target. The first is to abate the sources that are causing the stresses, under the assumption that the stress will subside if the source is removed. The second is to directly abate the stresses that may persist once the source is removed.

Conservation strategies are developed and implemented to (1) abate the critical sources of stress (i.e., threat abatement); and (2) directly restore altered key attributes of the systems (i.e., restoration). Threat abatement may involve a number of approaches including direct actions (e.g. removal of a culvert blocking a creek) or public education and outreach (e.g. educating property owners on the negative impacts of removing native vegetation that provides habitat). Restoration actions may include replanting native vegetation that is appropriate to the underlying soils and indigenous plant communities that historically thrived in a given location.[16]

In the Lower White River BMA planning process each of the conservation targets described in the previous chapter were reviewed in detail and potential threats identified. During this process Lower White River jurisdictions also identified conservation strategies to ascertain the level or severity of a potential threat, to directly abate known threats, or to identify restoration opportunities where degradation has occurred. Some threats applied to multiple conservation targets and as such the conservation strategies have been grouped under the following categories, which have been stated as a positive outcome:

- Reduce Habitat Conversion and Fragmentation (due to development and human activity)
- Enhance Water Quality
- Decrease Flooding
- Eliminate/Reduce Invasive and Introduced Species
- Remove Fish and Wildlife Movement Blockages
- Control Erosion and Siltation
- Halt/Reduce Predation by Domestic Animals

The discussion below provides recommended conservation strategies for each stress and source of stress to the conservation targets.

[16] TNC 5-S conservation action planning methodology.

Reduce Habitat Conversion and Fragmentation

Source of Stress: Development, Vegetation Removal and Deforestation

Conservation Strategies

1. Adjust the Lower White BMA boundary as evidence presents itself and after review by all jurisdictions, to better represent lands necessary for the long-term persistence of aquatic species, as well as other birds, mammals, amphibians, and reptiles.
   a. Work with all appropriate jurisdictions to adopt the Lower White River BMA Stewardship Plan and companion amendments to the Lower White River BMA boundary.
   b. Integrate the revised Lower White River BMA boundary into the Pierce County Comprehensive Plan Open Space Corridors Map
   c. Foster natural floodplain processes by preserving and creating conveyance areas (levee removal and/or setback) to accommodate flood waters
   d. Apply the Rural Sensitive Resource zoning to the tax parcels located within the revised Open Space Corridors Map at the county level.

2. Utilize Low Impact Development (LID) techniques within the BMA.
   e. Work with the Counties, Pierce and King Conservation Districts and other interested agencies to educate property owners on LID techniques.
   f. Work with the Counties, Cities of Buckley, Auburn, Pacific, and Sumner, and State Agencies to promote the use of LID on public properties.

3. Continue to apply native vegetation retention practices to environmentally sensitive areas within BMA.
   a. During review of development proposals work with the County and local jurisdictions in the design of projects that maintain native vegetation, wetlands, and shorelines and ensure mitigation efforts are appropriate and relevant to the development impacts.
   b. Enforcement of potential violations to existing regulations should receive a higher priority. Work with the County and City Councils to provide adequate staffing resources for this purpose.

4. Provide increased education and outreach to property owners, developers and real estate agents regarding impacts of vegetation removal and fish and wildlife habitat stewardship actions through organized community groups working with the cities and counties.
   a. Provide landscape consultation and on-going workshops (with guest speakers) to homeowners.
   b. Provide homeowners with literature on how to be a shoreline steward
   c. Create realtor packets with materials on shoreline stewardship to be given to new residents of shoreline properties.
   d. Present project at realty offices to get them to pass out realtor packets and educate on unique ecological characteristics of the communities.
   e. Contact developers and alert them about community projects and their role in transforming ideology around selective cutting vs. clear cutting a property
   f. Create homeowner information packets that describe the location and importance of corridors. Include all certified backyard habitats/sanctuaries to help inspire people to get involved.

5. Participate in local land use advisory meetings regarding proposed developments that affect the BMA
   a. Landowners who live within or are interested in a development that is located within jurisdictional boundaries of a city should attend City Planning Commission meetings to provide input into development proposals. Those who live within the jurisdictional boundaries of unincorporated

Pierce or King County should go to the County Planning Commission meetings.
   b. Create a phone tree (provide agency numbers of enforcement for community) to contact community members when a proposed development is being reviewed by the City or County.
   c. Have group placed on interested parties list for notification by the City or County of any development proposals within or adjacent to the BMA.
   d. Advocate for conditions that eliminate or minimize threats to the conservation targets.
   e. Work with developers to achieve a "win-win" solution (i.e. utilizing density bonus for open space and where best to locate open space areas in relation to the BMA and adjacent wildlife habitat areas).

6. Consider application of special zoning that provides for greater environmental protection and less density (i.e. the RSR zoning either through a Comprehensive Plan amendment process or adoption of a new Community Plan or the city equivalent -downzoning) to LWR BMA areas that are located in unincorporated rural portions of Pierce and King Counties. Also, consider requiring LID and other environmentally sensitive design techniques within the LWR BMA areas.
   a. Any future updates to the White River Basin Plan should include a review of additional habitat areas for inclusion within the BMA.

7. Work with the counties, cities and developers to locate open space set aside areas in contiguous tracts or within contiguous conservation easements located in such a manner as to promote connectivity and proximity to the conservation targets including:
   a. Identify the best locations for designated open space areas during the development proposal review process.
   b. High priority open space set aside areas are along tributaries and the White River.
   c. New development in forested areas should provide their open space dedications adjacent to the BMA as first priority.
   d. Establish connectivity and habitat zones around wetlands and White River and adjacent forest areas which provide habitat.
   e. Refer to the Washington Department of Fish and Wildlife (WDFW) landscape planning document[17] for guidance to help maintain fish and wildlife habitat including:
      i. Maintain habitat connectivity within the BMA and adjacent habitat areas through corridors and permeable landscape mosaics.
      ii. Proactively address wildlife and road issues by routing traffic through less sensitive wildlife areas, locate development with road placement and traffic intensity issues for wildlife in mind, and provide connectivity linkages across roads that intersect habitat patches or corridors.
      iii. Rectify existing road conditions that cause wildlife mortality at important crossing areas such as in connective corridors, or amphibian crossing locations, through road and wildlife planning approaches.
      iv. Maintain larger habitat areas to support development sensitive species.
      v. Preserve rare landscape elements and associated species and connected areas with critical habitats.
      vi. Retain large contiguous or connected areas that contain priority habitats and species.
      vii. Preserve large habitat areas and sensitive locations through land use planning mechanisms like outright purchase, purchase of development rights, conservation easements, and transfer of development rights.

[17] Schuett-Hames, J.P., J.M. Azerrad, M.J. Tirhi, B. Vadas Jr., C.L. Sato, C.W. May, J.L. Hayes, J.E. Jacobson, J.P. Carleton, and G.F. Wilhere. Draft 2008. Landscape Planning for Washington's Fish and Wildlife: Managing for Biodiversity in Developing Areas. Washington Department of Fish and Wildlife. Olympia, WA.

viii. Maintain natural hydrologic conditions and minimize surface runoff using low-impact site design principles and the retention of natural forest and wetland cover throughout the watershed.
ix. Protect water quality using a combination of innovative treatment BMPs and aggressive, comprehensive source controls.
x. Maintain watershed processes (e.g., delivery and routing of water, sediment, nutrients/toxicants/bacteria, large wood, heat, forest succession, and upland disturbance regimes).
xi. Protect in-stream habitat and natural channel morphological conditions through the control of storm-water inputs and bank-full flows.
xii. Protect the stream-riparian ecosystem corridor, channel migration zone (CMZ), and floodplain.

f. Develop and implement community/school education programs (1) to prevent the introduction of nonnative species such as bullfrogs and fish, and (2) to encourage wildlife friendly, responsible pet ownership.
g. Place open space areas in such a manner as to create a transition area of native plants/vegetation between developed and non-developed areas thus reducing the edge effect.

8. Maintain or restore at least 65% native vegetation throughout the LWR BMA and White River Sub-basin to maintain normal hydrological functions, as well as connectivity for wildlife. This can be done per residence, and can be boosted by keeping some large habitats in natural condition.
   a. Provide educational materials to homeowners in the Puyallup River Watershed, and especially to property owners within the BMA and along the shorelines of the White River, on the importance of retaining native vegetation and forest cover.
   b. Work with developers to identify best locations for native vegetation retention and open space set asides.
   c. Work with property owners to plant, retain, and restore buffers around the White River, tributaries and wetlands.
      i. Organize work parties as an annual or biannual native vegetation planting event. Consider partnering with local Boy Scout or Girl Scout troops, schools, or other environmental or civic organizations for volunteers.
      ii. Target identified restoration areas for native vegetation planting events.
      iii. Pursue grant programs to help fund the purchase of native plant materials or work with local plant nurseries, Pierce and King Conservation Districts, developers or other potential sources to obtain native plant supplies.
   d. Conduct monthly seminars on various components of creating wildlife habitats.

9. Encourage targeting the purchase of land within the Lower White River for wildlife habitat.
   a. Work with property owners located within the BMA to identify parties who are interested in selling their property or a portion of their property for permanent open space, passive recreation, or conservation easement.
   b. Compile a list of willing sellers, property owners or other properties within the BMA that are a high priority for acquisition as permanent open space.
   c. Reduce the threat of habitat conversion and fragmentation (resulting from development and human activity) by purchasing PSE lands or other undeveloped open space areas along the river corridor (King County).
   d. Work with the cities of Buckley, Auburn, Pacific, Sumner and the Cascade Land Conservancy to promote purchase or transfer of development rights for high priority open space properties within the BMA.

e. Submit applications to the Pierce County Conservation Futures Program for acquisition of high priority open space properties.

10. Apply for National Wildlife Federation – Community Habitat Program certification and conduct public education and outreach efforts to property owners to participate in this program and certify their property as backyard wildlife sanctuaries.

Source of Stress: Roads and Driveways

11. Avoid new public and private roads that bisect and fragment the BMA considering the following criteria:
    a. Consider first the expansion of existing roads located outside or on the fringe of the BMA and install wildlife mitigation measures with the road expansion project.
    b. If a new road is the only feasible option, construct the roadway with wildlife mitigation measures.[18]
    c. Avoid new roads that bisect open space set aside areas.
    d. Utilize WDFW's landscape planning document to help plan where roads should go based on fish and wildlife information.

12. Work with the counties and cities to install signage along Lower White River BMA that indicates the motorist is traveling through a "sensitive wildlife area" and that this road is a "wildlife crossing area". Signage should include a caution statement to watch out for and avoid wildlife that may be crossing the road.

13. Seek to identify alternative driveway access points rather than introduce new stream crossings.

Enhance Water Quality

Source of Stress: Application of Fertilizers, Pesticides and Herbicides

Conservation Strategies

1. Evaluate the impacts to White River and its tributaries, and groundwater supplies resulting from the use of fertilizers, pesticides and herbicides on properties within the BMA.
    a. Collect water quality data over a five year time period.
    b. Work with the Tacoma Pierce County Health Department (TPCHD), Pierce County Public Works and Utilities (PWU), Pierce Conservation District (PCD) or a local water steward group to identify testing sites, gain access to monitoring equipment, etc.
    c. Work with to acquire commitment from the TPCHD, PWU or PCD for sampling kits and lab costs to establish water quality information at different reaches along the White River.
    d. Educate property owners within the BMA on the importance of having their well water tested on a regular basis. Utilize this information to determine if any of the well water supplies are contaminated from the use of fertilizers, pesticides or herbicides or other toxins.
    e. Partner with local Boy Scout or Girl Scout troops, schools, or other environmental or civic organizations to conduct monitoring and sampling of local streams and the White River. Consider creation of a booklet produced by students about the water quality monitoring in Lower White

[18] Schuett-Hames, JP. J.M. Azerrad, M.J. Tirhi, B. Vadas Jr., C.L. Sato, C.W. May, J.L.Hayes, J.E. Jacobson, J.P. Carleton, and G.F. Wilhere. Draft 2008. Landscape Planning for Washington's Fish and Wildlife: Managing for Biodiversity in Develop Areas. Washington Department of Fish and Wildlife, Olympia, WA.

River and how the testing results impact the biodiversity in the BMA. Teachers and biologists could work with students to create booklet.

2. Replace the use of chemical fertilizers, pesticides and herbicides with natural, organic and permaculture methods.
   a. Provide increased education and outreach to property owners regarding negative impacts of using non-organic pesticides and fertilizers and demonstrate natural alternatives (such as the use of biological pest control).
   b. Provide this information as one of the community workshop topics or hold a Community Education Day to walk the neighborhood to distribute literature.
   c. Work with PCD, WSU – Pierce County Cooperative Extension Office (WSU) or other sources to identify natural methods now available.

3. Eliminate/discontinue the spraying of herbicides within the public right-of-ways and public owned land within the BMA by working with the County Public Work Utilities Departments to assess spraying regimes.
   a. Property owners can install "no-spray" signs on their properties along public right-of-ways.
   b. Park and road maintenance crews can alter spraying practices within BMA area and should consider utilizing Integrated Pest Management systems as an alternative to the use of chemicals.
   c. Property owners can provide education and outreach to public agencies on why pesticide-free parks are beneficial.

4. Plant, retain, and restore buffers to prevent runoff from reaching the streams and river.
   a. Work with jurisdictions include Washington Department of Natural Resources (DNR) to strengthen reforestation requirements through tighter timelines. Currently DNR applicants have two years to replant after logging.

Source of Stress: Domestic Animal Waste

Conservation Strategies

5. Acquire commitment with county/TPCHD for fecal coliform sampling kits and lab costs.
   a. Collect fecal coliform water quality data for five years through local monitoring group.

6. Implement Pierce County pet waste education program.

7. Clean up after pets and livestock through community composting.
   a. Provide property owners with educational information/materials on why this is so important (i.e. impacts associated with waste)
   b. Work with local nurseries to institute a community compost program.

8. Use fencing to create a buffer between riparian (i.e. the lake, creek and estuary) and wetland areas and livestock pasture areas.
   a. Encourage property owners with livestock to develop farm management plans.
   b. Provide property owners with livestock educational materials on cost-share programs to install fencing between pasture areas and riparian and wetland areas.

Source of Stress: Septic Tanks

Conservation Strategies

10. Work with property owners to test all the septic tanks for possible contamination into the system.
    a. Explore available Pierce County or Tacoma-Pierce County Health Department programs to check septic tanks.
    b. Explore any available incentive programs to help homeowners pay for this.
11. Collect fecal coliform water quality data within water bodies and watercourse for five years.

12. Develop and/or distribute informational packets about septic tanks that go out to all residents.

Source of Stress: Runoff from Roads and Fields

Conservation Strategies

13. Review all local jurisdictions' planning documents to determine if any storm water drains in the BMA area discharge directly into a water body, watercourse or wetland. If this information is not available then work with the County or PCD to conduct an inventory to determine if any such stormwater drains exist. If there are any stormwater drains that discharge directly into a water body, watercourse or wetland then develop a community drain stenciling event to mark these drains to prohibit discharge into them.

14. Plant native vegetation along roads, driveways, roadside ditches, and channels of the tributaries to filter road runoff pollutants.

15. Work with local jurisdictions to apply new road maintenance standards to public right-of-way areas to reduce harmful impact from runoff from roads.

16. Identify culverts and ditches that deposit road runoff directly into a waterbody, watercourse or wetland. If this information is not available then work with the county or PCD to conduct an inventory to determine if any such culverts or ditches exist. If there are any culverts or ditches that discharge directly into a waterbody, watercourse or wetland than work with the local jurisdiction to apply mitigation measures for pre-treatment prior to discharge. Consider applying low impact development techniques for mitigation measures.

17. Remove or move pipes in fields and industrial parks to channel untreated stormwater runoff into detention areas.

Source of Stress: Trash/Garbage

Conservation Strategies

18. Develop a trash pickup campaign along roadways.
    a. Work with local schools, neighborhood associations and local property owners to participate in an Adopt-a-road program to pick up trash and garbage.

19. Organize garbage cleanup days and/or educate property owners on need to keep garbage and pollutants out of habitat areas.
    a. Coordinate with Nonpoint Watershed Committee. This is an action item in the Watershed Plan.

20. Create a watchdog team for development to report garbage dumping. When appropriate utilize the Pierce County Responds Program to report garbage dumping in the area.

a. Coordinate with Nonpoint Watershed Committee. This is an action item in the Watershed Plan.

Eliminate Invasive and Introduced Species

Source of Stress: Introduced Plant Species and Weeds

Conservation Strategies

1. Conduct a detailed inventory of the plants within the BMA to identify the density of invasive species and determine target areas for non-native/invasive plant removal and replanting of native vegetation.

2. Provide educational information to property owners and plant nurseries regarding the impact of local non-native and invasive plant species.
   a. Develop or obtain a booklet of invasive local weeds and mail to local property homeowners. Booklet should include the following information: list of undesirable non-native and/or invasive plant species; methods of removal; native plants that can be used to revegetate; wildlife benefits of native plants; etc.
   b. Contact local nurseries to discuss the impacts of non-native/invasive plant species on habitat areas and the potential to limit or eliminate the sales of non-native or invasive plant species and increase the sales of native plant species.
      i. Explore the possibility for local nurseries to host monthly education community meetings
      ii. Request local nurseries to distribute brochures on the benefits of utilizing native plant species
      iii. Work with local nurseries to host native plant sales in conjunction with BMA events
      iv. Request local nurseries to label invasive plant species

3. Work with local property owners and municipal jurisdictions to remove non-native and invasive plant species within the BMA.
   a. Organize a "Weed Walkabout" workshop for the community.
   b. Organize weed cleanup activities utilizing PCD, schools, Boy Scout troops, or other local volunteers.
   c. Contact Pierce County and the cities' Public Works and Parks Departments about removal of invasive species within the road right-of-way and public properties.

Source of Stress: Introduced Non-Native Wildlife Species

Conservation Strategies

5. Educate the homeowners and pet stores on the damage that is done when they turn loose non-native fish and wildlife species into wetlands, tributaries, and other habitat areas within the BMA.
   a. Include this information as part of lake information packet or fact sheet that should be developed for distribution to area property owners.
   b. Species that should be listed in the information packet include but are not limited to turtles, frogs, and aquarium fish.
   c. Contact local pet stores to discuss the impacts of non-native/invasive fish and wildlife species on habitat areas and the potential to limit or eliminate the sales of non-native fish and wildlife species.
   d. Contact WDFW enforcement if non-native species are being sold.

6. Collect and destroy bullfrog egg masses.
   a. Establish a bullfrog eradication program that lasts a minimum of 3 years, which could be part of a whole wildlife monitoring plan and/or water monitoring program.

7. Fence livestock out of creeks and wetland and their associated buffer areas.
   a. Partner with PCD staff to educate and work with property owners to help develop farm management plans and with funding for fencing to keep livestock out of stream.

   b. Provide educational materials to property owners with livestock on negative impacts associated with unrestricted access to creeks and wetland areas and incentive/grant programs to help defray the cost of fencing.

Remove Fish and Wildlife Movement Blockages

Source of Stress: Culverts

Conservation Strategies

1. Work with King and Pierce County, Cities of Buckley, Auburn, Pacific, and Sumner, PCCD and homeowners to replace existing culverts that are causing fish blockages.

Source of Stress: Roads and Driveways

Conservation Strategies

2. Monitor road kills and develop strategy for better wildlife crossings where most of the kills take place. Employ different strategies for the various species based upon their needs such as:
   a. Amphibians may need crossings under roads.
   b. Mammals need speed limit reduction, better signage, and connective corridors linking areas throughout the watershed with the large forest patch to the east.

3. Work with the County to establish signage along Lower White River roads that indicates this is a "sensitive wildlife area" and to drive with caution.

4. Encourage the development of a booklet for county, developers, park districts to explain the history and conservation efforts of Friends of the Lower White River and other community groups. Put on multiple websites to keep everyone aware of progress.

5. Provide education to landowners regarding the importance of maintaining vegetation corridors along roadways and driveways so that wildlife can have alternative movement corridors.

6. Work with the County, cities and developers to design new roadways within BMA to be wildlife friendly. Roads should not create barriers and should utilize new technologies in ecological road design that incorporates the needs for stormwater treatment, safety and ecology functions (e.g. bioswells).

Source of Stress: Fencing

Conservation Strategies

7. Utilize fencing that does not block wildlife movement from occurring.
   a. Avoid solid board on board fencing in wildlife movement corridors.
   b. Utilize smooth (as opposed to barbed) wire fencing for livestock that minimizes potential for injuring wildlife. An example is New Zealand smooth wire fencing.

Control Erosion and Siltation

Source of Stress: Channelization/Levees

Conservation Strategies

1. Riparian buffers along the King County-maintained levees and revetments are limited in quality, width, and connectivity along the river corridor.
    a. Recommendations to remove and set back levees, restore riparian buffer, and connect the river to its historical floodplain habitat are part of King County's adopted 2006 Flood Hazard Management Plan.

Source of Stress: Development

Conservation Strategies

1. Monitor new construction activities to ensure that erosion control measures are properly installed and functioning from preventing erosion into ditch systems, watercourse, wetland and estuary areas.
    a. Local residents should call Pierce County Planning and Land Services Department with any potential violations of erosion control measures.

Halt Predation by Domestic Animals

Source of Stress: Cats and Dogs Allowed Unconstrained Access to Outdoors

Conservation Strategies

1. Provide educational materials to property owners and residents on keeping domestic pets away from nesting areas and habitat areas during breeding season.
    a. Distribute handouts on keeping cats and dogs indoors (Seattle Audubon has good handouts on this).
    b. Address this issue as part of backyard habitat seminars.

Minimize Water Fluctuation

Source of Stress: Water Fluctuation

Conservation Strategies

1. Work with the counties and cities to maintain buffers around wetlands to reduce major water fluctuation in the seeps, springs, wetlands and creeks feeding into the Lower White River.

2. Work with the counties, cities, DNR, and property owners to maintain or restore ≥65% natural vegetation throughout the Lower White River BMA to maintain normal hydrological functions (including water level fluctuation in wetlands), as well as connectivity for wildlife. This can be done per residence, and can be boosted by keeping some large patches in natural vegetation.
    a. Work with property owners within BMA to leave portions of the property in native vegetated condition. This can be done in conjunction with backyard wildlife sanctuary program.
    b. Organize native planting work parties with local property owners and interested non-profit agencies, schools, Boy Scout troops, Stream Team, etc.

c. Work with property owners that have Forest Practices permits issued by DNR to not allow applicants to log in wetland buffers and increase their less restrictive buffers, restoration and reforestation requirements.

Source of Stress: Low Water Flow

Conservation Strategies

3. Maintaining the water level is a high priority in order for the Lower White River to function as a true river. Work with the Muckleshoot Tribe and other jurisdictions to maintain enough water in the river.

4. Conduct a review of adopted stormwater and watershed plans, or if necessary work with the County and cities to conduct a new analysis, to determine if any storm drains are directing water flow into the White River, tributaries and streams, or wetlands.

5. Work with the counties and cities to redirect any public storm water drains that discharge directly into a water body or water course into a pre-treatment facility that is designed to slowly infiltrate the water back into the aquifer (e.g. Low Impact Development facility).

6. Encourage property owners to leave properties in an open space condition and, as an incentive, enroll their properties in the County's Current Use Assessment Program (Public Benefit Rating System) to reduce taxes.

7. Encourage property owners to conserve water and when possible, reuse water.
   a. Provide educational materials to property owners regarding reuse of grey water and rainwater for watering plants; use of native plant species that require less water; best times for watering vegetation (i.e. not in the heat of the day when large amount of water is lost to evaporation); etc.

8. Work with the Pierce and King County Health Department, the counties' and cities' water departments and compare with planned development to identify where all of the current water sources are and future planned water sources.

Short-Term Actions (1 year)

1. Work with Pierce County Planning and Land Services Department and all other applicable jurisdictions during the year 2011 Comprehensive Plan amendment cycle to:
   a. Adopt the Lower White River BMA Stewardship Plan as a Title 19D document
   b. Amend the Pierce County Comprehensive Plan Open Space Corridors Map and Biodiversity GIS layer to incorporate the revised Lower White BMA boundary as evidence presents itself.
   c. Revise the zoning within all applicable jurisdictions to apply the RSR zoning to tax parcels located within the expanded BMA boundary.

2. Apply for National Wildlife Federation – Community Habitat Program. *(Registered)*
   a. Set participation goals for the 10 landowners in the BMA.
   b. Conduct public education and outreach efforts to property owners to participate in this program and certify their property as backyard wildlife sanctuaries.
   c. Establish a 65% native vegetation and forest cover goal for the entire BMA.

3. Conduct surveys and collect 'best science' information about the Lower White River riparian system.
   a. Encourage members to participate in the *NatureMapping* Program.
   b. Work with school-related and other citizen projects in surveying the area.
   c. Collect latest information on how to keep private property and the riparian system healthy.
   d. Coordinate efforts with other groups.

4. Provide increased education and outreach to property owners, developers and real estate agents regarding impacts of vegetation removal and earth moving. Create and dispense educational materials concerning fish and wildlife habitat stewardship actions.
   a. Maintain signage along Lower White River roads that indicates the motorist is traveling through a "sensitive wildlife area" and that this road is a "wildlife crossing area". Signage should include a caution statement to watch out for and avoid wildlife that may be crossing the road.
   b. Create homeowner information packets that describe the location and importance of corridors. Include all certified backyard habitats/sanctuaries to help inspire people to get involved. Provide homeowners and developers with literature on how to be a shoreline steward.
   c. Create realtor packets with materials on shoreline stewardship and on unique ecological characteristics of community to be given to new residents of shoreline properties.
   d. Provide landscape consultation and on-going workshops (with guest speakers) to homeowners and others.

5. Participate in local land use decisions regarding proposed developments that affect the BMA. Advocate for conditions that eliminate or minimize threats to habitat fragmentation.
   a. Work with Pierce County to include the BMA's are Habitats of Local Importance in Title 18E and develop/provide guidelines as how to regulate relative to proposed/possible development.
   b. Create a phone tree (provide agency numbers of enforcement for community) to contact community members when a proposed development is being reviewed by the County.

c. Have group placed on interested parties list for notification by the County of any development proposals within or adjacent to the BMA.
d. Work with the cities of Buckley, Auburn, Pacific, and Sumner, and developers to help identify the best locations for designated open space areas during the development proposal review process. Try and come up with a "win-win" solution (i.e. utilizing density bonus for open space and where best to locate open space areas in relation to the BMA).

6. Work with King County as they apply for Salmon Recovery Funding Board and other grant(s) to facilitate implementation of high priority restoration actions within the BMA.
   a. Identify properties along the Lower White River to facilitate levee setback and floodplain reconnection projects for King County.

Mid-Term Actions (2-3 years)

1. Organize volunteer work parties. Partner with local Boy or Girl Scout troops, schools, or other environmental or civic organizations for volunteers.
   a. Sponsor annual or biannual native vegetation planting event.
   b. Sponsor invasive species eradication events.
   c. Sponsor volunteer "bioblitz" activities led by professional experts.
   d. Consider a project with the cities' Parks Departments to create a demonstration project, cooperating with Pierce County Conservation District, Master Gardeners, schools, Boy Scout troops, or other local volunteers.

Long-Term Actions (3-5 years)

1. Conduct surveys and collect 'best science' information about the Lower White River riparian system.
   a. Coordinate with the Watershed Planning groups for current data.
   b. Arrange for Stream Team assistance in collection information on water quality and flow for the next five years.
2. Inventory biodiversity around schools and within sections of the White River and monitor changes.
   a. Arrange for *NatureMapping* training through the Tacoma Nature Center for local residents and students for five years.
3. If needed, adjust BMA boundaries and amend the Open Space Map in the Pierce County Comprehensive Plan.

Chapter VI - Conclusions

General Overview
The availability of lowland deciduous, riparian, estuarine and upland coniferous habitats along the Lower White River contributes to this BMAs ecological richness. Most of the at-risk, listed, and/or priority species predicted or confirmed within this BMA have a primary association with water for either all or part of their life cycle. Water quality within the White River, its tributaries, streams, and wetlands should not be compromised as it contributes foremost to the presence of the species predicted within.

Farmlands and pasturelands along Lower White River continue to collect water and could be targeted for wetland restoration sites by willing sellers. In their present state, they may provide breeding locations for amphibians. Sections of Lower White River located on private property, where native vegetation has been removed to the river's edge, should be targeted for habitat restoration. Future land development should not allow removal of native vegetation along the creek within a defined buffer. Culverts along the creeks should be assessed for blockage to fish movement and the community should work with the local jurisdictions and Pierce County to correct these blockages and identify other target areas for restoration and protection. Landowners along these creeks, and within defined buffers of the Lower White River, should be educated on maintaining the integrity of the riparian corridors. Education should focus on vegetation retention and restoration, retaining in-stream flows to White River, and the biological importance of the Lower White River corridor. The Lower White River BMA would benefit by the application of WDFW PHS Riparian Habitat Guidelines on privately owned riparian lands and by enforcing county regulations for development along riparian corridors. WDFW PHS recommendations for salmonids and county critical area ordinance standards should also be applied in consideration of salmonid presence.

The community should coordinate with the Forest Stewardship Council for working forestland owners (minimum of 20 acres) and continue to monitor wildlife species within and adjacent to the BMA. This can be accomplished through participation in the *NatureMapping* Program and Tahoma Audubon birding events.

Certification Through Wildlife Habitat Programs
FLWR, neighborhoods, and the Puyallup River Watershed Council should pursue certification in the NWF-CWH program. FLWR, Puyallup River Watershed Council, and city Parks Departments from Buckley, Auburn, Pacific, and Sumner should also continue to promote property owner participation in the WDFW-BWH program.

Pursuing Conservation Strategies
The conservation strategies outlined in Chapter IV provide a framework for abating threats to the Conservation Targets and conducting restoration of degraded habitat areas. FLWR and other community groups should work towards accomplishing the conservation strategies outlined in this plan.

Funding Options
The National Wildlife Federation Community Habitat Program has provided an initial grant to FLWR to install signage and conduct training. In addition, the NWF also has grant monies available for schools to assist in native vegetation planting and monitoring for Lower White River. FLWR and other community groups should also consider pursuing funding opportunities through state and local agencies, the PCD, and environmental foundations.

Stewardship Plans by Jurisdictions

The Lower White River BMA runs through six jurisdictions; the cities of Buckley, Pacific, Auburn, Sumner, King County, and the Muckleshoot Indian Tribe.

Although the Lower White River BMA has the same conservation targets, the stressors and subsequent conservation strategies, recommendations, and stewardship plans were tailored to individual jurisdictions. The following chapters were developed with input from each jurisdiction, except the Muckleshoot Indian Tribe, who currently has chosen not to participate with the stewardship planning process.

Appendices

Meeting Agendas – Buckley

September, 2009
October, 2009
November, 2009

Kickoff Meeting Agenda for September 21, 2009

Buckley Library

Time	Topic	Discussion Leader
6:00	Introductions	Linda
6:15	Pierce County Biodiversity Network Overview & questions	Karen/Michelle
7:00	LWR Stewardship Plan and Buckley's chapter	Linda/Karen/Michelle
7:30	Next steps	Linda
7:45	**Community *NatureMapping* Workshop** October 10-11 at Northwest Trek	Karen

Lower White River Biodiversity Management Area
Buckley and Vicinity

Community Workshop #2

Monday, October 12, 2009
6:00 p.m. to 8:00 p.m.
Enumclaw Library

6:00 – 6:10 p.m.	Welcoming comments and review of BMA network
	PCBA slide logo and partners
	Mission to implement and protect bd network
	Picture of network
6:10 – 6:40	Start at terminology - define
	Conservation target and definition
	Threats (stressor) – give bullfrog examples
	Sources of stress - release of exotics (Japanese knotweed)
	Conservation strategy - actions
	Change CVA examples to Buckley
6:40 – 6:50	Break time
6:50 – 7:00	Buckley and vicinity Stewardship Plan overview
	Start with conservation strategies in draft plan
7:00-7:45	Threats to conservation targets (make a slide)
	Read each individual bullet and discuss
7:45 – 8:00	Closing discussion

Next Meeting –November 16, 2009, 6:00 p.m. TBD

Lower White River Biodiversity Management Area
Buckley and Vicinity

Community Workshop #3
Monday, November 16, 2009
6:00 p.m. to 8:00 p.m.
Enumclaw Library

6:00 – 6:05 p.m.	Welcome
6:05 – 7:00	National Wildlife Federation Backyard Habitat
7:00 – 7:45	Segue into biodiversity Review last meeting terminology – questions? Conservation target and definition Threats (stressor) – give bullfrog examples Sources of stress - release of exotics (Japanese knotweed) Conservation strategy - actions Begin Matrix
7:45 – 8:00	Closing discussion

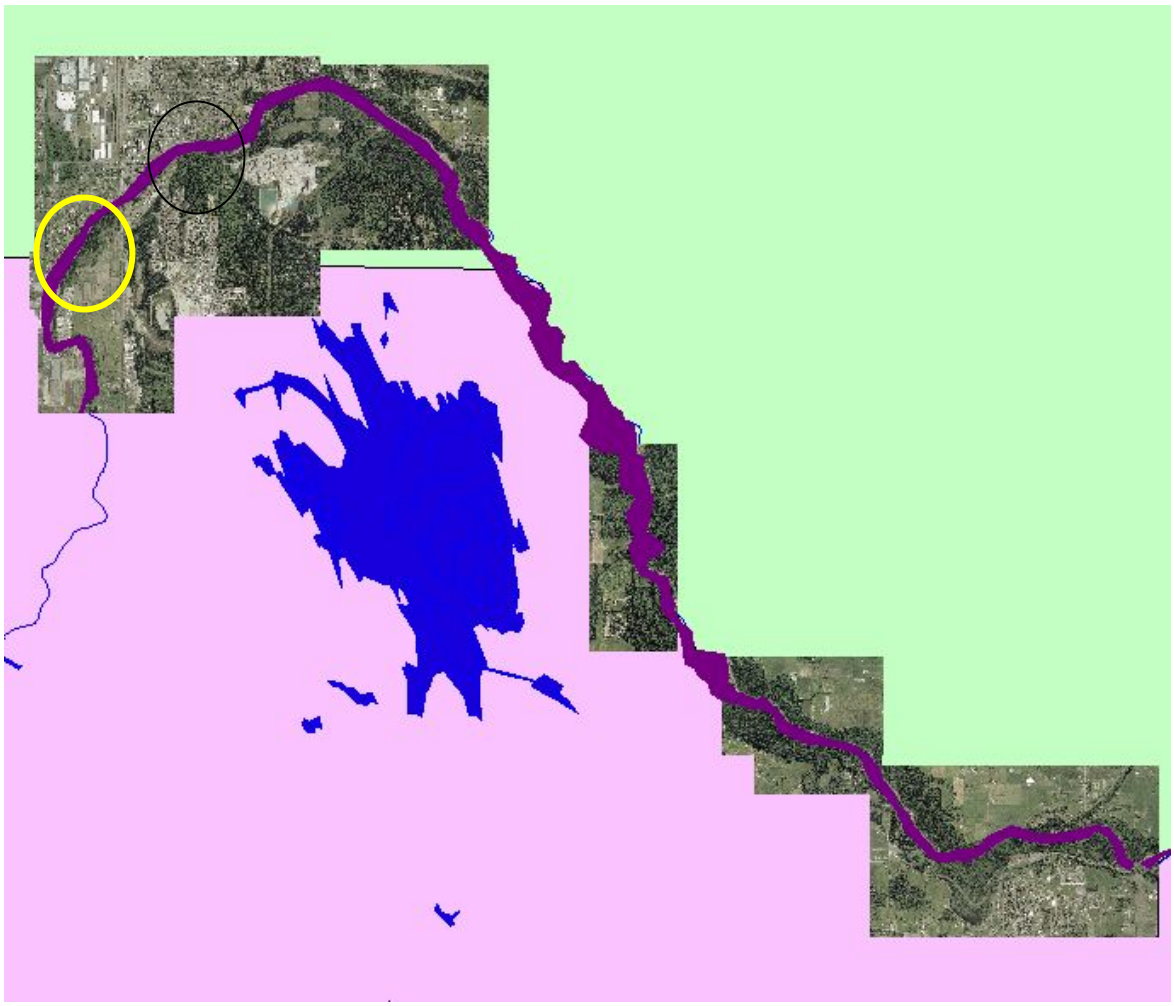
Next Meeting –January 11, 2010, 6:00 p.m. TBD

Pierce County Biodiversity Network
Lower White River 2007 Bioblitz
at Selected Sites - Pacific

A Work in Progress of the

Pierce County Biodiversity Alliance (PCBA)

(Pierce County Planning and Land Services, University of Washington, Washington Department of Fish and Wildlife, MetroParks Tacoma, Puyallup River Watershed Council)



What is Biodiversity Planning?

Biodiversity planning is a method used to identify land areas that provide for a biologically diverse representation of species. This planning method considers long-term ecosystem health and establishes a goal of maintaining adequate habitat to ensure the continued viability of a diversity of species within an ecoregion.

Lower White River BioBlitz
June 3-4, 2006 and April 21, 2007

What is a BioBlitz? A rapid biological inventory of the plant and animal diversity found in a designated area during a 24-hour time frame.

Purpose

• To continue the implementation of conservation planning for the Biodiversity Network with landowners and experts to build enthusiasm around biodiversity preservation through open discussion and exploration with experts.
• To assess the quality of habitat and confirm species predicted within the Lower White River BMA.

Who was involved?

2006: Over 100 experts from natural resource agencies, universities, museums, Tahoma and Seattle Audubon, individuals with expertise on specific taxa, such as beetles, bats etc., volunteers, and landowners participated. The bioblitz was funded by a grant from the Washington Biodiversity Council.

2007: Twenty-five experts and volunteers spent 12 hours blitzing 3 sites: Auburn Wilderness Park, City of Pacific Park, and Pierce/King County Water Resources property. The bioblitz was funded by a grant from the Environmental Protection Agency.

The Results

	June 2006	Earth Day April 2007
Volunteers Cost	100 $17,300	40 $2,129 (not including mileage
Area Sampled	1,593 acres	50 acres
Length of bioblitz	24 hours	12 hours
Taxa Teams		
Birds	3 teams	1 team
Amphibians/Reptiles	3 teams	
Mammals Trackers - Mammals	3 teams	1 team 3 teams
Plants	3 teams	2 teams
Invertebrates		
Aquatic	1 team	
Mollusks	2 teams	
Butterflies/Moths	2 teams	
Beetles	2 teams	1 team
Spiders	1 team	

2006 & 2007 Bioblitz Comparison

	2006	2007
Birds	81	40
Mammals	25	17
Amphibians	7	0
Reptiles	3	2
Fish	5	0
Invertebrates	207	12
Plants Note: 2006 totals were adjusted after the final report was issued.	230	196

City of Pacific
City Park
King & Pierce County Properties

	2006	2007
Birds	46	27
Mammals	19	14
Amphibians	0	0
Reptiles	0	2
Fish	0	0
Invertebrates	0	0
Plants	75	142
Non-native	36	61
Trees	13	21
Shrubs	9	26
Grass/forbs	53	95

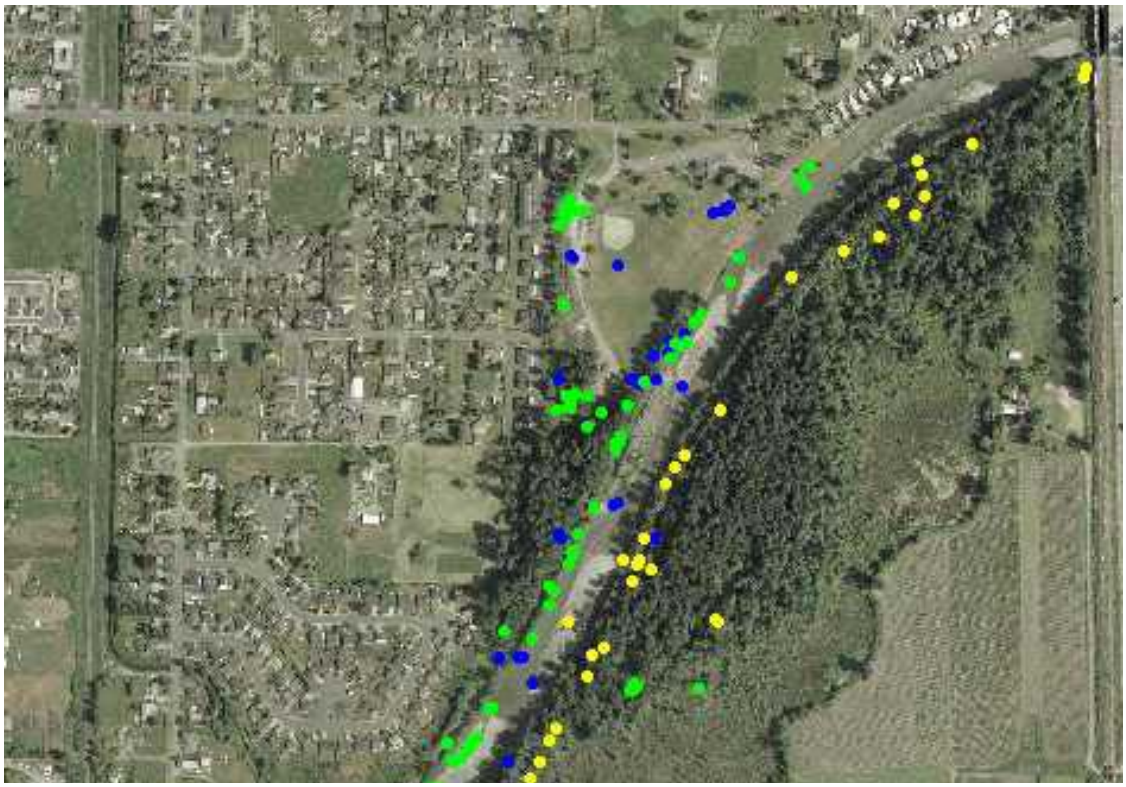
City of Pacific and Vicinity 2006

Bioblitz data were reported at the locations marked below:

Mammals – yellow

Birds – blue

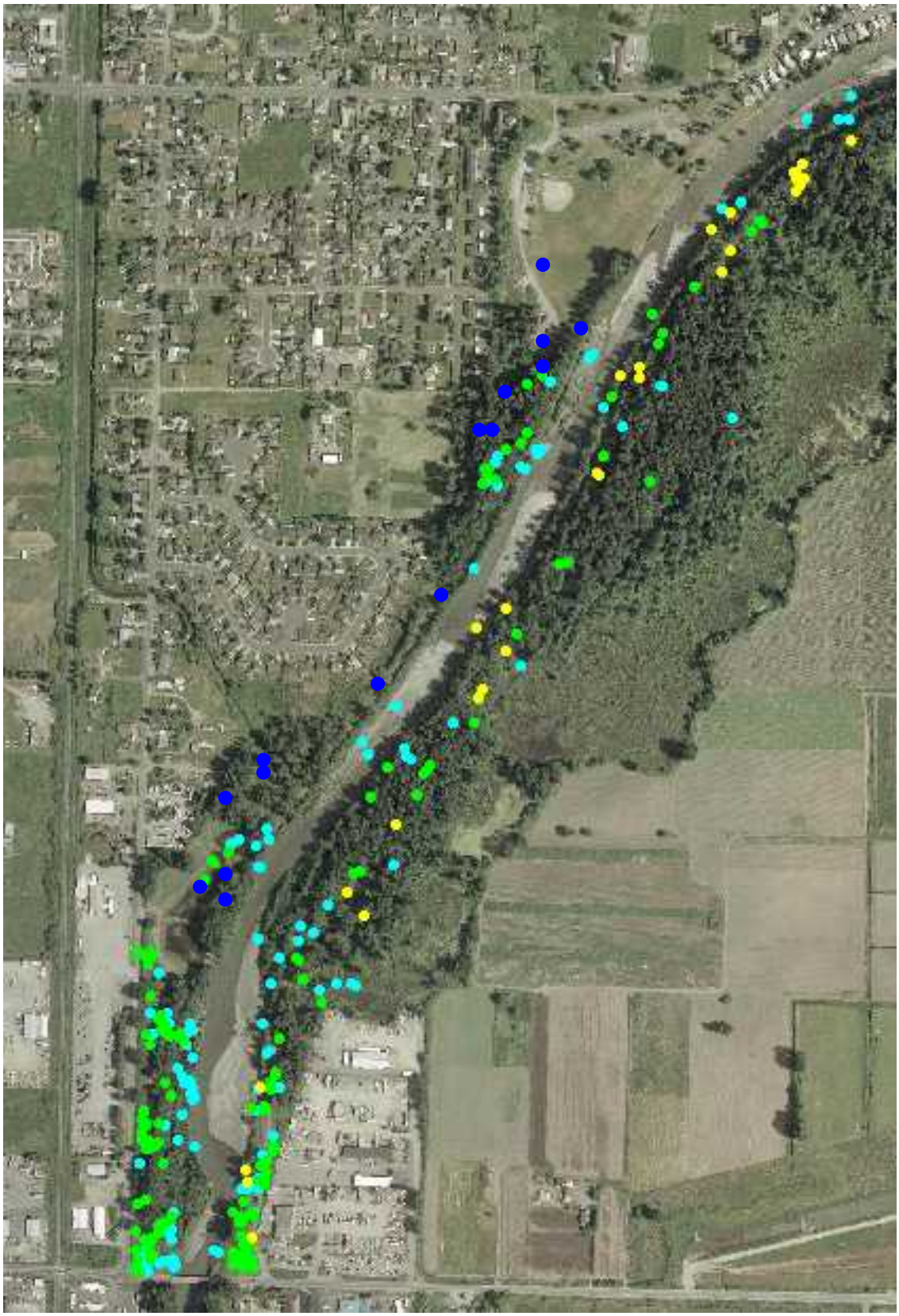
Plants - green



Pierce County Water Programs 2006

City of Pacific and Vicinity 2007

Bioblitz data were reported at the locations marked below:
Mammals – yellow … Mammal Trackers – light blue
Birds – blue
Plants - green



March 24, 2015

Mr. Jack Dodge
City of Pacific
100 3rd Avenue SE
Pacific, WA 98047

Subject: 2015 Comprehensive Plan Update

Dear City of Pacific Planning Commission:

I am writing on behalf of American Rivers to express our support for the amendment to the City of Pacific's Comprehensive Plan to include goal NE-10: *Protect biodiversity along the White River in Pacific* and policies; NE-10.1: *Finalize, implement actions, and track progress of the Lower White River Biodiversity Management Area (BMA) Stewardship Plan*, NE-10.2: *Identify partners and volunteer citizen groups who can advance the Lower White River BMA Stewardship Plan*, and NE-10.3 *Coordinate with other jurisdictions within the Lower White River BMA (Sumner, Auburn, Buckley, Pierce County, King County, Muckleshoot Tribe of Indians) and meet periodically to align goals, objectives and strategies, and monitor progress*.

American Rivers is a national conservation organization devoted to protecting wild rivers, restoring damaged rivers, and conserving a clean water supply for people and nature. We have had an office in the Puget Sound area since 1992, and in 2014 listed the White River as one of America's Most Endangered Rivers™ due to fish passage problems at the Buckley diversion dam.

In 2000 a Biodiversity Network consisting of 16 Biodiversity Management Areas (BMA) was created in Pierce County. These BMA's are the "best of the best" ecosystems. The Network includes the Lower White River BMA, which partially lies within the City of Pacific's boundaries.

Biodiversity is defined as the existence of a wide variety of plant and animal species in their natural environments. Maintaining biodiversity is economically valuable because it provides breathable air, drinkable water, food, pollution and pest control, and resilience after natural catastrophes, such as floods and drought.

Additional benefits of planning for biodiversity conservation include:

- Protection for remaining high-quality land cover important for fish and wildlife

- Implements Growth Management Act requirements for Habitat Conservation Areas
- Provides regional connectivity network for fish and wildlife dispersal and migration
- Establishes a proactive approach to help avoid future listings under the Endangered Species Act.

Protecting biodiversity in freshwater ecosystems and river corridors is a top priority for American Rivers. We strongly support the City of Pacific's commitment to conserve biodiversity in coordination with new development, especially in the Lower White River BMA, which has already been identified as an area of extreme importance. Please support these amendments that encourage protecting biodiversity.

Sincerely,

Michael D. Garrity
Director, Rivers of Puget Sound and the Columbia Basin

Adriana Hess Audubon Center
2917 Morrison Road West
University Place, WA 98466
(253) 565-9278
www.TahomaAudubon.org

March 16, 2015

Mr. Jack Dodge
City of Pacific
100 3rd Avenue SE
Pacific, WA 98047

Subject: 2015 Comprehensive Plan Update

Dear City of Pacific Planning Commission:

I am writing on behalf of Tahoma Audubon Society, the Pierce County chapter of Audubon with over 1,800 local members, to express our support for the amendment to the City of Pacific's Comprehensive Plan to include goal NE-10:

Protect biodiversity along the White River in Pacific and policies; NE-10.1: *Finalize, implement actions, and track progress of the Lower White River Biodiversity Management Area (BMA) Stewardship Plan*, NE-10.2: *Identify partners and volunteer citizen groups who can advance the Lower White River BMA Stewardship Plan*, and NE-10.3 *Coordinate with other jurisdictions within the Lower White River BMA (Sumner, Auburn, Buckley, Pierce County, King County, Muckleshoot Tribe of Indians) and meet periodically to align goals, objectives and strategies, and monitor progress*.

In 2000, a Biodiversity Network consisting of 16 Biodiversity Management Areas (BMA) was created in Pierce County. These BMA's are the "best of the best" ecosystems. The Network includes the Lower White River BMA, which partially lies within the City of Pacific's boundaries.

Biodiversity has been defined as the existence of a wide variety of plant and animal species in their natural environments. Maintaining biodiversity is economically valuable because it provides breathable air, drinkable water, food, pollution and pest control, and resilience after natural catastrophes, such as floods and drought.

Additional benefits of planning for biodiversity conservation include:

- Protection for remaining high-quality land cover important for fish and wildlife.
- Implements Growth Management Act requirements for Habitat Conservation Areas.
- Provides regional connectivity network for fish and wildlife dispersal and migration.
- Establishes a proactive approach to help avoid future listings under ESA.

Biodiversity is a top priority for Tahoma Audubon Soicety. We strongly support the City of Pacific's commitment to conserve biodiversity in coordination with new development, especially in the Lower White River BMA, which has already been identified as an area of extreme importance. Please consider supporting these amendments that encourage protecting biodiversity.

Sincerely,

Krystal Kyer
Executive Director

PUYALLUP River
Watershed Council

March 17, 2015

The Puyallup River Watershed Council
is a tax exempt
501(c)(3) nonprofit
Washington corporation

Mr. Jack Dodge
City of Pacific
100 3rd Avenue SE
Pacific, WA 98047

Subject: 2015 Comprehensive Plan Update

Dear City of Pacific Planning Commission:

I am writing on behalf of the Puyallup River Watershed Council to express our support for the amendment to the City of Pacific's Comprehensive Plan to include goal NE-10: *Protect biodiversity along the White River in Pacific* and policies; NE-10.1: *Finalize, implement actions, and track progress of the Lower White River Biodiversity Management Area (BMA) Stewardship Plan*, NE-10.2: *Identify partners and volunteer citizen groups who can advance the Lower White River BMA Stewardship Plan*, and NE-10.3 *Coordinate with other jurisdictions within the Lower White River BMA (Sumner, Auburn, Buckley, Pierce County, King County, Muckleshoot Tribe of Indians) and meet periodically to align goals, objectives and strategies, and monitor progress.*

In 2000 a Biodiversity Network consisting of 16 Biodiversity Management Areas (BMA) was created in Pierce County. These BMA's are the "best of the best" ecosystems. The Network includes the Lower White River BMA, which partially lies within the City of Pacific's boundaries.

Biodiversity has been defined as the existence of a wide variety of plant and animal species in their natural environments. Maintaining biodiversity is economically valuable because it provides breathable air, drinkable water, food, pollution and pest control, and resilience after natural catastrophes, such as floods and drought.

Additional benefits of planning for biodiversity conservation include:

- Protection for remaining high-quality land cover important for fish and wildlife.
- Implements Growth Management Act requirements for Habitat Conservation Areas.
- Provides regional connectivity network for fish and wildlife dispersal and migration.
- Establishes a proactive approach to help avoid future listings under ESA.

Address
c/o Mark Palmer
City of Puyallup
333 N. Meridian
Puyallup, WA 98371

Biodiversity is a top priority for Puyallup River Watershed Council. We strongly support the City of Pacific's commitment to conserve biodiversity in coordination with new development, especially in the Lower White River BMA, which has already been identified as an area of extreme importance. Please consider supporting these amendments that encourage protecting biodiversity.

Yours truly,

Kurt Fremont
President

Puyallup Tribe of Indians

March 23, 2015

Mr. Jack Dodge
City of Pacific
100 3rd Avenue SE
Pacific, WA 98047

RE: 2015 Comprehensive Plan Update

Dear City of Pacific Planning Commission:

I am writing on behalf of Puyallup Tribal Fisheries Department to express our support for the amendment to the City of Pacific's Comprehensive Plan to include goal NE-10: *Protect biodiversity along the White River in Pacific* and policies; NE-10.1: *Finalize, implement actions, and track progress of the Lower White River Biodiversity Management Area (BMA) Stewardship Plan*, NE-10.2: *Identify partners and volunteer citizen groups who can advance the Lower White River BMA Stewardship Plan*, and NE-10.3 *Coordinate with other jurisdictions within the Lower White River BMA (Sumner, Auburn, Buckley, Pierce County, King County, Muckleshoot Tribe of Indians) and meet periodically to align goals, objectives and strategies, and monitor progress.*

Biodiversity has been defined as the makeup of plant and animal species in a specific area and in their natural environments. Maintaining biodiversity provides a measure of society's ability to co-exist in an area while maintaining a healthy and representative proportion of indigenous species.

Additional benefits of planning for biodiversity conservation include:

- Protection for remaining critical habitat for fish and wildlife.
- Implements Growth Management Act requirements for Habitat Conservation Areas.
- Provides regional connectivity network for fish and wildlife dispersal and migration.
- Establishes a scientifically based reference that can be used over time to monitor species abundance.

Biodiversity is an important metric for the Puyallup Tribe. We strongly support the City of Pacific's commitment to conserve biodiversity in coordination with new development, especially in the Lower White River BMA, which has already been identified as an area of extreme importance. Please consider supporting these amendments that encourage protecting biodiversity.

Sincerely,

Russ Ladley
Resource Protection Manager
Puyallup Tribal Fisheries

6824 Pioneer Way East • Puyallup, Washington 98371 • (253) 845-9225 • (253) 445-2430

Jack Dodge

From: Jack Dodge
Sent: Friday, March 20, 2015 3:04 PM
To: Karen Walter
Cc: Paula Wiech; Jack Dodge
Subject: Comments on Comprehensive Plan Amendments
Attachments: Comp Plan Graphics-F3-x-Stream.pdf; Countyline Levee Improvements.jpg

Hi Karen, following is the City response to your comments. If you have any questions, please email me or call me at 253-929-1107.

1. Generally the changes are favorable and should provide better protection for streams, the White River, floodplains, wetlands and their associated buffers than the previous plan with the proposed additional language. However, we do have some comments and concerns regarding the language in the Comprehensive plan (both existing and proposed) as noted below.

2. The floodplain section should be revised by starting with avoidance of further development within the floodplain. Engineering solutions to prevent flooding of properties are limited; often not successful; require frequent maintenance, and generally degrade fish habitat. (See https://sites.google.com/site/jonczuba/research/aggradation). The White River in Pacific is an area where the river naturally aggrades and is filling with sediment as documented in recent USGS sediment studies (see http://pubs.usgs.gov/of/2012/1242/pdf/ofr20121242.pdf; http://pubs.usgs.gov/fs/2011/3083/ ; and http://pubs.usgs.gov/sir/2010/5240/).

   Thank you for your comment. The City will insert some language regarding the construction of new structures within the flood fringe. As you are aware, the King County Flood Control District will be relocating the levees on the left and right banks of the White River in Pacific (see attached map). The levee relocations will provide for greater flood storage capacity in the White River in Pacific, Sumner and Pierce County. The levee relocation will also allow the river to more naturally migrate its channel and provide enhanced fisheries and wildlife habitat. Construction of the left bank levee improvements is intended to begin this year. The projected start date for the right bank improvements is in 2017.

   King County has also been purchasing residences/parcels in the White River Estates Subdivision and along 3rd Pl. SE in Pacific in anticipation of the right bank levee relocation. Residences purchased in the White River Estates subdivision were within the currently designated 100 year flood plain and have been removed. Once the levee relocation improvements are completed, remaining undeveloped property in the City beyond the right bank of the White River will be less likely to be flooded.

   If you have any questions regarding the levee relocations, please contact Jeanne Stypula, King County at:

   Jeanne Stypula, PE, Supervising Engineer, King County River and Floodplain Management
   201 South Jackson Street, Suite 600, Seattle, WA 98104
   (206) 477-4833 email: Jeanne.Stypula@kingcounty.gov.

3. Pacific also needs to be using the most current floodplain information available from FEMA regarding the extent of the floodplain to ensure that land use decision are based on the best available information.

   Thank you for your comment. The City is aware that the current floodplain information available from FEMA is outdated due to the increased elevation of the White River channel. FEMA has not yet provided updated maps of the 100 year floodplain based on new river channel elevations. The most recent information regarding floodplain elevations in Pacific is provided by King County as part of the levee setback project. King County met with FEMA in 2011 and 2013 to discuss how to provide hydraulic modeling information to FEMA for a flood map revision to reflect the levee setback project (Countyline Project). In July 2013, FEMA put into place new mapping policies called the "Levee Analysis and Mapping Procedures" that are applied to levees when FEMA prepares flood zone maps. At that point in July 2013, FEMA put new mapping efforts on hold until they could figure out how to apply these new procedures. New mapping of the White River has not yet been prepared using these new procedures. The City and County are still waiting for FEMA to initiate its mapping procedures.

4. The stream classification information in 3.3.1 needs to be verified. Using WA DNR's water typing maps solely may not be the appropriate information for urban areas as these maps were intended to be used in areas of long-term commercial forestry and not urban areas. While WDNR may show stream information for urban areas in the FPARS system, these areas were not necessarily field verified by WDNR, WDFW, or tribal staff to support the water typing classification shown on the FPARS maps. We have raised concerns with the non-fish bearing classification the City has used for some locations on Milwaukee Creek/Ditch and Boeing Creek for specific projects and yet to receive actual data for these streams to compare against the physical criteria of fish-bearing streams from WAC 222-16-031. This is an important issue to resolve in the course of this Comprehensive Plan update to ensure that the best available data/science is used now with a requirement that individual projects further verify stream classification for their portions of affected streams to account for any changes such as culvert projects that improve fish access to areas currently unavailable due to fish passage barriers. Improving fish passage usually results in changes in fish distributions which would affect stream classifications. Even seasonal streams can be used by salmon (see Attached paper from Oregon).

   Thank you for your comments. Absent a comprehensive stream assessment and inventory of Milwaukee Creek, the information supplied by DNR provides the most up to date information that the City can rely on. The City has also reviewed the Washington Dept. of Fish and Wildlife "Washington State Fish Passage Inventory" map in relation to the DNR stream typing. The WDFW map appears to confirm, in part, the DNR typing.

   The City will proposed a new policy under "Fish and Wildlife Habitat Protection" to reflect the need to use "Best Available Science" when typing creeks and streams within Pacific. This policy may read as follows:

   Policy NE 6.8:
   Incorporate the use of "Best Available Science" (BAS) when typing the creeks/streams within the City of Pacific.

   Discussion: *The use of "Best Available Science" (BAS) is necessary to ensure the proper typing of streams in Pacific. The use of experts in the field of fishery resources can provide the needed expertise to meet the BAS requirements under the GMA. A joint effort between the City of Pacific, City of Sumner and the Muckleshoot Indian Tribe should be considered to conduct a stream assessment of Milwaukee Creek, Government Canal and other unnamed tributaries to the White River in Pacific and Sumner.*

   The City would welcome a joint effort between the Muckleshoot Tribe and the City of Sumner to apply for grant funds to conduct a comprehensive stream assessment and inventory of Milwaukee Creek from its origins in Pacific/Algona to its confluence with the White River in Sumner. A joint effort between the City and the Muckleshoot Tribe regarding the Government Canal and other creeks in the City would also be considered.

   In this vein, the City has applied for two King County Conservation Futures Grants (CFT) to purchase two undeveloped properties adjacent to Milwaukee Creek in Pacific. One parcel is .41 acres with Milwaukee Creek on its western boundary. Should the City receive the grant and purchase the property, the City intends to remove non-native invasive vegetation and replant the riparian corridor along Milwaukee Creek. Milwaukee Creek at this point is classified as Type "F" under the DNR FPARS system. The City may also enhance or create a wetland on the property.

   The second parcel of property is located upstream from the above parcel and is .18 acres. Milwaukee Creek bisects the parcel. The riparian corridor along the creek has been denuded. The intent of the City is to replant the riparian corridor should the City receive the grant and purchase the property. Regarding both grant requests, the City of Pacific would welcome the Muckleshoot Tribe's support of the grant applications.

5. There are no streams shown on Figure 3.1.

   Figure 3.2 Creeks/Streams is attached.

6. It should be noted that the WDOE Stormwater Management Manual does not fully mitigate for all impacts to salmon. The Manual clearly notes this; therefore, statements regarding the adequacy of mitigation from this manual needs to be made clear in the Comprehensive Plan. Even with stormwater management (including treatment), there are still likely impacts from stormwater discharges due to the reduced and simplified habitat condition of receiving waters, as well as the limitations in technology to remove pollutants. As noted in the attached article (Attachment #2), stormwater can adversely affect species such as coho.

Thank you for your comment. It is not the intent of the City to state that stormwater impacts can be totally mitigated through use of the stormwater manuals. The City realizes that all impacts cannot be mitigated based on the manuals. The only way to avoid impacts is to not allow any new development, which is not a viable option. The manuals can be used to help minimize stormwater impacts. This is reflected in Policy NE 1.4 which "Encourage(s) the use of a variety of technologies that minimize environmental degradation and protect public health". The following discussion of the policy provides a couple of sources where mitigation techniques can be used to minimize impacts. If you have some additional "example" language you could provide or have other sources that provide helpful techniques to reduce impacts of stormwater runoff, feel free to send them to me.

7. Temperature and Dissolved oxygen problems in the lower White River are also a concern. Existing trees that provide a source of shade (and wood) along streams and the White River need to be fully protected and additional trees added to restore riparian processes. This means the proposed built structures within 200 feet of the White River should be relocated to avoid impacting existing trees and their functions. Existing structures should also be evaluated to see if they can be relocated to provide riparian and floodplain restoration opportunities.

   Thank you for your comment. The City certainly agrees that the shading of river and stream corridors is a top priority. Existing trees and vegetation need to be retained. In areas where buffers have already been impacted and denuded, the replanting of buffers should be done as part of mitigation related to new development, grants or the use of other techniques including volunteer replanting programs (such as adopt-a-stream programs).

   Development within 200 feet of the White River is subject to the requirements of the Shoreline Management Act (SMA). Under the SMA, the City received approval of its updated Shoreline Master Program (SMP) from the State in 2013. The program allows development within 200 feet of the White River dependant on the shoreline designation. Based upon the proposed levee relocation project by King County in Pacific, a number of homes adjacent to the White River have been purchased and removed to provide riparian and floodplain restoration opportunities.

8. There are no streams shown on Figure 3.1.

   See response to #5 above.

Again, thank you for your comments.

Jack Dodge
Community Development Manager
City of Pacific

PACIFIC PLANNING COMMISSION

DRAFT

Meeting of March 24, 2015
Minutes

Call to Order

Chairman Boyd called the Regular Meeting to order at 6:00 PM and led the flag salute.

Attendance

Commissioners Present: John Boyd, Don Blackwell, Wayne Strong and Scott Newbold
Absent: Howard Gustafson (excused)
City Staff Present: Planner Paula Wiech, Community Development Manager Jack Dodge, and Secretary Gail Bennett

Approval of Agenda

Commissioner Blackwell moved to approve the agenda as presented, seconded by Commissioner Newbold. MOTION CARRIED UNANIMOUSLY.

Approval of Minutes

Commissioner Strong moved to approve the February 24, 2015 meeting minutes as presented, seconded by Commissioner Blackwell. MOTION CARRIED UNANIMOUSLY.

Commissioner Blackwell moved to approve the March 17, 2015 Special Meeting minutes, seconded by Commissioner Strong. MOTION CARRIED UNANIMOUSLY.

Audience Participation

Gary Nitschke, 102 Butte Ave, informed the Commission about a course that is available for the Commissioners regarding the Open Public Meetings Act. Paula will research the information and pass it on to the Commission.

PUBLIC HEARING 2015 Comprehensive Plan Update
Revised Chapter 3 – Natural Environment
Revised Chapter 8 - Transportation

Chairman Boyd opened the hearing at 6:10 pm and asked for staff input. Jack Dodge explained his responses to the letter from the Muckleshoot Tribe that was received at the last meeting. He stated that Chapter 3 – Natural Environment has been revised to address some of their comments. Revisions were highlighted in blue on the draft Chapter 3

Comprehensive Plan changes. Jack said that a letter was received from Michael D. Garrity, Director of the Rivers of Puget Sound and the Columbia Basin, who strongly supports the City of Pacific's commitment to conserve biodiversity in coordination with new development, especially in the Lower White River BMA, which has already been identified as an area of extreme importance. In addition, Jack provided a Creeks/Streams map (Map 3.2) as well as an updated soil map (Map 3.1). Jack stated that the mapping of streams has not been updated in many years and that King County is working on levy setbacks. The Commissioners received the draft revised Chapter 8 Transportation handout.

Chairman Boyd asked for public comment on the Chapter 3 Natural Environment element.

Linda Burgess, 12822 51st E, Edgewood, from the Pierce County Biodiversity Alliance stated her support of the plan.
Jerry Broadus, 901 16th St. SW, Puyallup, from the Tahoma Audubon Society, supports leaving areas diverse and natural and is in favor of leaving trees in the natural environment.
Jeanne Fancher 37428 55th Ave S, from the Friends of the Lower White River, showed a handout of the biodiversity management area. She is in support of the language in the Comprehensive Plan and wanted to thank the Commission and Staff for adding the revised language.

After further discussion Jack recommended the Commission adopt "Biodiversity" as an appendix to the Comprehensive Plan.

Chairman Boyd asked for public comment on the Chapter 8 Transportation element.
There were no comments.
Chairman Boyd closed the Public Hearing at 6:37 PM.

Commissioner Blackwell moved that the Planning Commission approve and forward to City Council revisions to Chapter 3 – Natural Environment as presented by staff and add an appendix titled the Lower White River Biodiversity Management Area Stewardship Plan, seconded by Commissioner Newbold. MOTION CARRIED UNANIMOUSLY.

Commissioner Newbold moved that the Planning Commission approve and forward to City Council revisions to Chapter 8 – Transportation as presented by staff, seconded by Commissioner Strong. MOTION CARRIED UNANIMOUSLY.

Adopted 2015 Planning Commission Work Plan

Jack reported that the City Council approved the 2015 Work Plan and has requested the Planning Commission put the Highway Sign District at the top of the list. He also reported that City Council voted to add an extra member to the Planning Commission for a total of seven members including one youth member.

Highway Sign District

Staff is still reviewing the information they have in the office and this topic will be discussed at the next Planning Commission meeting.

Status of Commissioner Gustafson

Paula reported that Howard's wife will write a letter to the Planning Commission about his resignation.

Tabled until further notice

Detached Accessory Parking Structures, Total Impervious Surface in Single-Family Zoning, Political and Highway Special District Signage, and Green Acres Place Annexation.

Adjournment

There being no further business, the meeting was adjourned at 7:15 pm.

Prepared by
Gail Bennett, Secretary

Approved _____2015 by _____
Date Planning Commission Chairperson
John Boyd

AGENDA ITEM NO. 4B

Agenda Bill No. 15-068

TO: Mayor Guier and City Council Members

FROM: Public Works

MEETING DATE: May 4, 2015

SUBJECT: King County Flood District Flood Reduction Fund Application for financial assistance to open and close the park

ATTACHMENTS: Resolution 2015-252
King County Flood District Flood Reduction Fund Application

Previous Council Review Date: N/A

Summary: The City of Pacific stakeholders have requested use of the 3rd Ave SE City Park during the non-flood season. This requires time and effort to remove the HESCO barriers at the points of ingress and egress. The King County Flood District Flood Reduction Fund is a potential source of funds to pay for opening and closing the park.

Recommendation/Action: Staff recommends Council approve Resolution No. 2015-252.

Motion for Consideration: Move to approve Resolution No. 2015-252, A RESOLUTION AUTHORIZING THE CITY OF PACIFIC TO MAKE APPLICATION FOR KING COUNTY FLOOD DISTRICT FLOOD REDUCTION FUND FOR FINANCIAL ASSISTANCE TO OPEN AND CLOSE CITY PARK.

Budget Impact: There is no immediate budget impact associated with the passage of this measure.

Alternatives: Deny the measure and find alternative funding source to pay to open and close the park.

CITY OF PACIFIC
WASHINGTON

RESOLUTION NO. 2015-252

A RESOLUTION AUTHORIZING THE CITY TO MAKE APPLICATION FOR FINANCIAL ASSISTANCE TO THE KING COUNTY FLOOD DISTRICT FLOOD REDUCTION FUND IN ORDER TO OPEN AND CLOSE CITY PARK

_____

WHEREAS, the citizens of Pacific use the City Park for community and personal activities; and

WHEREAS, the opening and closing of the park for purposes of stakeholder use and flood protection is a costly and time consuming, and is also a task beyond the budget and skill level of the City, and

WHEREAS, by completing and submitting the application, the City of Pacific agrees to conform to the regulations, statutes, terms and conditions of the King County Flood District Flood Reduction Fund Program if the requested funds are granted.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF PACIFIC, WASHINGTON, DOES RESOLVE AS FOLLOWS:

Section 1. The Pacific City Council hereby authorizes the Mayor to execute and submit an Application with King County Flood District for Flood Reduction Funds in the amount of $50,000 for construction services to open and close City Park.

Section 2. This Resolution shall take effect and be in full force upon passage and signatures hereon.

PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 11th DAY OF MAY, 2015.

CITY OF PACIFIC

_____
Leanne Guier, Mayor

ATTEST/AUTHENTICATED:

_____
Amy Stevenson-Ness, City Clerk

Approved as to form:

_____
Carol Morris, City Attorney

THE KING COUNTY FLOOD DISTRICT
FLOOD REDUCTION FUND
2015 APPLICATION FORM

Fund eligibility and requirements

The Flood Reduction Fund targets medium and small local flood reduction projects including projects where the control of stormwater will have a direct benefit in reducing flooding.

- There is no cap on the award amount, except up to the annual amount allocated to the Flood Reduction Fund of $2.88 million.
- Matching funds are encouraged but **not** required.
- The expenditure of funds must be completed no later than 36 months after receiving funds.
- An annual status report and final project completion report are required.

Eligible applicants

Homeowner associations; private non-profit organizations or associations; schools; special districts; Tribes; and King County jurisdictions**. Not eligible**: private individuals, businesses, and consultants.

Eligible projects

1. The proposal is consistent with the evaluation criteria and provides a flood reduction benefit such as, but not limited to:
   - Surface water overflows.
   - Near-shore flooding.
   - Lake flooding due to outflow blockage.
   - Clearance of clogged agricultural drainage systems.
   - Slope stabilization when slope failure is caused by the design inadequacy or failure of a stormwater system.
   - Assessment of existing conditions as part of the creation of a lake management district.
2. The proposal provides a broad economic benefit, such as:
   - Maintaining access to goods and infrastructure that serve a larger agricultural economy.
   - Providing navigable water channels for industry and recreation.
3. The project is reasonable based on the following criteria:
   - Project purpose and goals are consistent with this grant program.
   - Implementation of the project is realistic and well-thought out.
   - The budget is feasible for the kind of activity proposed, is sufficiently detailed, and leverages other resources.
   - Partners and stakeholders are engaged in several phases of this project.
   - The project team is qualified to carry out the project.
   - The project legacy, through oversight or continuous improvements, is assured.
   - Readiness to proceed is assured (e.g., design is finalized and permits are secured or are being expedited as an incentive to start the project).

Ineligible projects

The following types of projects will not be considered for funding:

- Projects that are already eligible for funding under Watershed Resource Inventory Area (WRIA) programs, such as:

    - Habitat improvement projects where flood hazard reduction is not the primary purpose.
    - Salmon habitat enhancement projects.
- Projects whose design and/or performance may transfer flooding problems upstream or downstream.
- Projects that do not compensate for the loss of restored or undisturbed natural habitat or may adversely impact habitat or water quality.
- Projects that do not include on-the-ground structural improvements as a deliverable, except for the assessment of existing conditions related to the creation of lake management districts.
- Projects included on the King County Flood Control District 6-year Capital Improvement Project list.

Supplemental items for consideration The project selection team will evaluate whether or not a proposed project provides any of these additional optional items:

- Project results in multiple benefits, such as:
    - Demonstrable water quality improvement to a listed body of water.
    - Recreational access.
    - Ecosystem protections and improvements not limited to salmon.
    - Safeguarding critical facilities.
    - Improved access to maintain the economic viability of a community, including water access.
    - Channel migration zone protection.
- Project leverages state, federal and local programs and funding directed towards floodplain management efforts.
- Project provides matching funds (not required).

What, When, Where to Submit

If filing by mail, submit **one copy** of this application. For electronic filing of the application, all attachments must be electronic files or links to web pages. The deadline for submitting an application will be **May 29, 2015**.

- **STANDARD MAIL:** Sylvia Aro, King County Department of Natural Resources and Parks, Water and Land Resources Division, King Street Center, 201 South Jackson Street, Suite 600, Seattle, WA 98104
- **ELECTRONIC MAIL:** wlr-rivers@kingcounty.gov

For more information or assistance, please contact King County River and Floodplain Management at wlr-rivers@kingcounty.gov or call 206-477-7777.

THE KING COUNTY FLOOD DISTRICT
FLOOD REDUCTION FUND
2015 APPLICATION FORM

Applicant: **City of Pacific**		
Project title: **City Park Flood Barrier Reconstruction**		
Contact: **Lance Newkirk**	**Phone #1:** **(253) 929-1113**	**Phone #2:**
Email: lnewkirk@ci.pacific.wa.us	**Web Site:**	
Address: **100 3rd Avenue SE**		
City: **Pacific**	**State:** **WA**	**Zip:** **98047**
Body of water or watershed of project: **White River**		
Community where project is located: **City of Pacific**		
Street location or address of project: **600 3rd Avenue SE**		
Alternate contact: **Jim Morgan**	**Phone:** **(253) 929-1115**	**Email:** **jmorgan@ci.pacific.wa.us**
Brief Project Statement (3 short sentences max.) The purpose of the project funds is to reimburse the County Flood Control District for the opening and closing of the City Park in the City of Pacific. The facility is used for potential flood mitigation and requires isolation in the form of HESCO barriers. The County has the necessary expertise to perform this construction in a competent cost-effective manner.		
Request: **$ 30,000/20,000** **Date of request:** **November 1, 2015 / April 1, 2016**		

Be sure to include and checkmark the following prior to sending your application:
☒ A cover letter signed by a person authorized to approve a legal agreement with King County.
☐ OPTIONAL: A fact sheet or brochure on your organization describing its history and accomplishments, site maps, etc.

☒ Checkmark if you have received or are you receiving any King County funding for this project and list funding sources, years and amounts below.

Phone numbers, addresses and email addresses will be made public (e.g., request from the public or listed in a publication).
☐ "Please do not publish this information."
☒ "King County may publish this information except for..." (Identify information to be excluded):

LEGAL STATUS
Are you formally organized as a corporation or government entity? ☒ YES ☐ NO
If you answered NO above, who will be fiscally responsible for your grant?

Which of the following describes your organization?
NOTE: *Private individuals, consultants or subdivisions of King County are not eligible.*
☐ SCHOOL
☐ SPECIAL DISTRICT
☐ TRIBE
☒ GOVERNMENT UNIT
☐ PRIVATE NON-PROFIT ORGANIZATION OR ASSOCIATION
(Note: Individuals acting on their own and businesses are not eligible.)

PRIVATE LAND
Is your project located on private land? ☐ YES ☒ NO
If you answered YES above, please describe the compelling public benefit of this project.

COMPLIANCE ACTION
Is your project in part or fully related to a conditional use permit, a required mitigation or corrective action?
☐ YES. Please contact Maureen Dahlstrom to verify eligibility at 206.477.4777or maureen.dahlstrom@kingcounty.gov.

PROJECT NARRATIVE

NOTE: *It is best to answer and edit the questions in a separate document and submit as an attachment then paste them in the shaded areas below.*

PROJECT BACKGROUND (NOT RATED)

Briefly explain IN ONE PAGE the history of the problem you are addressing in this project. How has the problem been addressed to date and by whom?

Cut and paste your narrative below

The City of Pacific operates and maintains a community park at 600 3rd Avenue SE on property owned by King County. The park is used for numerous community activities throughout the year. Changing conditions on the White River (elevated river bottom from sediment deposition) have increased flooding in the area requiring closure of the park during the wet season (November through March). The City needs assistance to open and close the park each year for use by the stakeholders of the region.

EVALUATED QUESTIONS

QUESTION #1 – PROJECT PURPOSE, GOALS, OBJECTIVES, OUTPUTS AND OUTCOMES

A. Describe what you plan to do and how it will specifically and measurably alleviate a significant local flooding problem AND provide a broad economic benefit, such as but not limited to: (a) maintaining access to goods and infrastructure that serve a larger agricultural economy or (b) improve or maintain navigable water channels for industry and recreation.

Cut and paste your narrative below

The proposed use of the funds is to retain the services of King County public works crew(s) to aid the City in the opening of the park in the Spring and the closing of the park in the Fall. The park is used as a flood storage area for the White River to alleviate flooding beyond the Pacific corporate limits. The park is a social center for the community with numerous annual community activities.

B. Describe the project objectives and the outputs that will carry them out. Include community awareness, community participation objectives and their outputs if any.

Cut and paste your narrative below

The primary objective is to provide the stakeholders with a safe park that is open for use during the non-flood prone seasons of the year. The timing of the opening and closing of the park, as coordinate with King County Flood Control District, is presented on the City web site, at council meetings, and on the local cable television station.

C. Describe 1) The tangible near term-outcomes of your project, 2) how you will measure their attainment and 3) describe the long-term outcomes

Cut and paste your narrative below

The short term goal is to have a safe open space for the stakeholders of the region to use during non-flood seasons of the year. The long term goal is to develop a permanent alternative flood barrier system, to the current HESCO barriers, that does not require a significant level of time or money to open and close the park. This will probably include elevated 3rd Avenue SE.

QUESTION #2 – IMPLEMENTATION

Please complete the scope of work for your project. Ensure that there is a clear path between the activities and the products or deliverables.

TASKS	ACTIVITIES AND DELIVERABLES	TOTAL SHARE OF AWARD FUNDS	DATES When is the task starting and ending?
EXAMPLE: SUB-TASK 1: Plant riparian vegetation	**Please address the who, what where, when, why, how, how many, how much as appropriate and in the most logical order. Here is an example:** **WHO** 10 volunteers **WHAT** will help create a riparian buffer **WHY** to shade Happy Creek **HOW** by planting **HOW MUCH/HOW MANY** 387 trees and shrubs along 500 ft of stream bank **WHERE** south of the Valley Road.	**FOR EXAMPLE:** $2,345	**WHEN** March 2006
Task 1	**The City will retain the services of King County Public Works to assist in the closing (place HESCO barriers, fill and compact sand in place, clean-up spoils) of the park in the Fall.**	**$30,000**	**November 2015**
Task 2	**The City will retain the services of King County Public Works to assist in the opening (remove and stockpile sand at an offsite location, Disassemble HESCO barriers, clean-up spoils) of the park in the Spring.**	**$20,000**	**April 2016**
Add more tasks below if necesary			
Permits/ permission (if applicable)	State all required project permits and authorizations (including right-of-way access) as follows: Name of permit, issuer, recipient, purpose and inclusive dates. If no permits or authorizations are required, state that none required.		**N/A**
Credits	As part of your project deliverables, provide a plan of **how, where and when** this grant will be acknowledged as funded by the King County Flood Control District.		
TASK 5 Final report	Submit a final report and the financial closeout documentation **no later that 30 days** after the end date of the project.		**June 15, 2016**

QUESTION #3 – PARTNERS AND STAKEHOLDERS

Identify who this project engages, how they will participate and what they will contribute during the various phases of planning and implementation or as a result of this project.

Cut and paste your narrative below

This project will be coordinated with our partner the King County Flood Control District. The stakeholders are the citizens of the region: Algona, Auburn, Pacific, Sumner and parts of unincorporated King and Pierce Counties.

QUESTION #4 – PROJECT TEAM

Describe the project team's roles and qualifications (including consultants and committed partners) in carrying out this project.

Cut and paste your narrative below

The team consists of City staff and elected officials as well as County staff and elected officials. There has been numerous years of a successful partnership to protect the stakeholders from flooding.

QUESTION #5 – LEGACY

Describe how the project will be maintained and/or if there is clear evidence that the planning of future phases of this project or of associated projects is well underway.

Cut and paste your narrative below

The City, the County, and the USACE have had preliminary discussions to develop a long term solution to replace

the HESCO barriers in the park. The temporary solution is effective, but requires regular mobilization of manpower and equipment to permit the full beneficial use of the park by the stakeholders.

QUESTION #6 – BUDGET

Please complete the budget spreadsheet below.

BUDGET ITEM	TOTAL	GRANT AWARD SHARE	FINANCIAL MATCH (not required)			MATCH TOTAL
			SOURCE	SOURCE	SOURCE	
			City Staff			
			AMOUNT			
STAFFING						
PROJECT SUPPLIES						
COMMERCIAL SERVICES AND CREW TIME	$50,000	$45,000	$5,000			$5,000
TRANSPORTATION						
OFFICE EXPENSES/OVERHEAD						
OTHER						
REAL ESTATE-RELATED COSTS						
TOTAL						

Describe how the amounts in the TOTAL column were calculated (Optional: Include a budget spreadsheet as an attachment)

STAFFING	
PROJECT SUPPLIES	
COMMERCIAL SERVICES AND CREW TIME	Local match estimates city staff manpower and equipment to be approximately 10 % of County crew time.
TRANSPORTATION	
OFFICE EXPENSES/OVERHEAD	
OTHER	
REAL ESTATE-RELATED COSTS	
TOTAL	

QUESTION #7 – READINESS TO PROCEED

Describe what is in place and what is missing – other than being awarded this grant – before you can begin your project. Estimate dates when you plan to have the missing elements in place.

Cut and paste your narrative below

There are no missing elements for this project. This project requires work at the beginning and end of the wet season (November through March). All the materials are reused at time of assembly and dis-assembly. In the event additional sand or HESCO barriers are required, the City will coordinate with County staff to acquisition of the materials.

QUESTION #8 – SUPPLEMENTAL CONSIDERATION

Supplemental consideration will be given if the applicant answers the following question:

Describe or summarize other benefits achieved by this project. Be specific in explaining how the project achieves these benefits and how it is crucial to achieving them.

- Project achieves multiple non-flood related benefits.

- Project stimulates the coordination and leveraging of state, federal and local programs and funding directed towards floodplain efforts.
- Project incorporates other floodplain management objectives.
- Project leverages other programs such as volunteer stewardship programs or partners' in-kind contributions (note that financial leverage, if any, should be addressed in Question #6) .

Cut and paste your narrative below

This project permits the stakeholders of the region to utilize a public asset. Many of the users of open space facilities are the economically disadvantaged. The annual maintenance cost will be eliminated upon development and implementation of a permanent solution – the elevation of 3rd Avenue SE.

OPTIONAL

You are strongly encouraged to include one or more of the following items as an attachment or links to a web page.

- Organization's brochure.
- Selected project accomplishments.

Attachments will be read at the reviewer's discretion. You are strongly recommended to limit your attachments or web page links to an absolute minimum.