

# 16 - Environmental and Cultural Review

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As part of the SAFETEA-LU (Safe Accountable Fair Efficient Transportation Equity Act - A Legacy for Users) legislation passed in 2005, metropolitan planning organizations are required for the first time to consult with federal, state and tribal wildlife, land management, and regulatory agencies during the development of the long-range transportation plan. The purpose of these discussions is to identify opportunities to reduce the potential negative impacts of the regional transportation system on natural resources within the planning area. In particular, SAFETEA-LU specifies that the Plan needs to contain a discussion of the

“...types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan.”<sup>1</sup>

The purpose of this analysis is not to focus on the impact of individual projects or the cumulative impact of all of the projects, but to raise awareness and understanding of the natural, cultural, and historical systems located within the SKATS urban area and their relationship to the transportation projects proposed in this Plan. Unlike the modeling of air quality that SKATS has been performing for over ten years, this assessment does not attempt to calculate with precision the transportation system’s impacts on specific resources.

This chapter contains a summary of the natural and cultural resources that are within the SKATS urban area, focusing on those features most likely to be affected by transportation projects, and a description of the general effects of transportation systems on ecological systems. This chapter also includes a summary of federal, state, and local laws, regulations, and policy that govern natural, historic and cultural resource management as well as local private and public conservation activities. In the analysis section, the mapping capability of a Geographic Information System (GIS) was used to determine areas where proposed regional projects intersected with the natural and historic resources in the area. The result of this assessment and opportunities to avoid, reduce, and mitigate anticipated effects are described. The chapter concludes with possible next steps for the region to follow. This includes a discussion of mitigation options that might be appropriate for the region and that need to be discussed with all local jurisdictional partners and regulatory agencies at a regional level. This chapter was developed with the assistance of local, state and federal resource agencies and was reviewed by members of the Collaborative Environmental and Transportation Agreement for Streamlining (CETAS), which includes representatives from many environmental, cultural and historical agencies.

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<sup>1</sup> SAFETEA-LU 23 CFR 134 (i) (2) (B)

# Natural Resources

The Salem-Keizer Metropolitan Area lies in the central Willamette Valley of western Oregon, straddling the middle reach of the Willamette River. As a consequence of its position in this rain-soaked landscape, the Willamette is the 13<sup>th</sup> largest river by volume and carries the most runoff for its land area of any river in the Continental United States<sup>2</sup>. This Oregon icon flows south to north, carving a meandering path between the Salem Hills, which force it to jog from west to east as it enters Salem and greatly narrow its floodplain on either shore in downtown Salem. Rickreall Creek joins the Willamette just southwest of the intersection of Highway 22W and Doaks Ferry Road, and Glenn Gibson Creek flows in through West Salem. Other tributaries flow through the city of Salem from the east, including Mill, Pringle, and Claggett creeks.

Historically, the area that is within the SKATS urban area was covered by a matrix of Oregon White Oak savanna and upland prairie. Savannas covered central, south, and west Salem. Areas of lower elevation—including what is now Keizer, the I-5 corridor, and lands to the east—were mostly prairie, kept free of brush and trees by seasonal burning by the indigenous Kalapuya people. Wetlands and wet prairie were located in the floodplains surrounding the numerous waterways in the area.

Over the past 150 years of Euro-American settlement, significant alterations of the landscape have taken place. These include loss of wetlands, wet and upland prairies, oak savannas, and oak woodlands through agricultural conversion, urban development, and fire suppression. The prairies and oak savannas are today among the most endangered ecosystems in North America and occupy less than one percent of their historic range<sup>3</sup>.

One consequence of this development is that grassland-dependant species have declined in numbers and many rivers and streams that once teemed with fish are now too warm, too polluted, or their channels too altered to provide adequate habitat. Federally listed threatened and endangered species for Marion and Polk counties are presented in **Table 16-1**, along with information on whether critical habitat has been identified for the species and whether that habitat is within the SKATS boundary. It should be noted that the plants and animals in the list might be present within the SKATS boundary, even if there is no designated critical habitat. There could be known populations of a species in the area, but critical habitat has not been designated. For example, there are known populations of Nelson's checker-mallow near the southern end of McNary Field and in the area of the Salem Parkway / I-5 interchange.

The majority of listed species with critical habitat identified in the SKATS area are fish. Chinook salmon and steelhead trout are listed as threatened, and thus the waterways that are essential or critical to their survival need to be protected. In addition, a number of the waterways in the SKATS area, including the Willamette River and Mill Creek, do not meet federal Clean Water Act regulations for several indicators, such as temperature, toxins, and bacteria. The waterways that are included in Oregon DEQ's 2004/2006 303(d) list for not meeting the Clean Water Act

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<sup>2</sup> Willamette River Basin Planning Atlas

<sup>3</sup>Mark V. Wilson, Oregon State University.

regulations are summarized in **Table 16-2**. The table also includes a designation of those waterways that provide habitat for the chinook salmon and steelhead trout.

These changes to the landscape and their consequences have progressed gradually and incrementally over time. Many went unnoticed until their cumulative effects could no longer be ignored. The human scale view of the landscape, where change is measured project by project, does not provide the perspective necessary to recognize landscape scale deterioration of ecological systems. Regional planning on the other hand does provide that 10,000-foot vantage point and a 20-year trajectory, offering an opportunity to avoid impacts caused by new facilities and improve the function of the existing elements of an evolving transportation system.

**Table 16-1  
Listed Species and Critical Habitat**

<b>Species</b>	<b>Critical Habitat Identified?</b>	<b>Critical Habitat in SKATS</b>
Bald Eagle	Y	N
Northern Spotted Owl	Y	N
Steelhead (Upper Willamette River)	Y	Y
Chinook salmon (Upper Willamette River)	Y	Y
Oregon chub	N	N
Coho salmon (Lower Columbia River)	Y	?
Steelhead (Lower Columbia River)	Y	?
Chinook salmon (Lower Columbia River)	Y	?
Fender's blue butterfly	Y	N
Golden Indian paintbrush	Y	N
Willamette Daisy	Y	N
Howellia	N	N
Bradshaw's lomatium	N	N
Kincaid's lupine	Y	N
Nelson's checker-mallow	N	N

**Table 16-2**  
**Clean Water Act and Fish Habitat Waterways**

<b>Waterbody</b>	<b>Clean Water Act Indicator</b>	<b>Chinook Salmon &amp; Steelhead Trout</b>	
		<b>Critical Habitat</b>	<b>Essential Habitat</b>
Battle Creek	Dissolved Oxygen		X
Battle Creek	Bacteria		X
Claggett Creek	Dissolved Oxygen		
Claggett Creek	Bacteria		
Clark Creek	Bacteria		
Croisan Creek	Dissolved Oxygen		
Croisan Creek	Bacteria		
Gibson Gulch	Dissolved Oxygen		
Glenn Creek	Bacteria		
Glenn Creek	Dissolved Oxygen		
Mill Creek	Bacteria	X	X
Mill Creek	Fecal Coliform	X	X
Pringle Creek	Dissolved Oxygen		X
Pringle Creek	Bacteria		X
Pringle Creek	Toxins		X
Pringle Creek	Temperature		X
Pringle Creek Tributary	Bacteria		
Pringle Creek Tributary	Toxins		
Rickreall Creek	Temperature		
Shelton Ditch	Dissolved Oxygen		X
Shelton Ditch	Bacteria		X
Willamette River	Temperature	X	X
Willamette River	Fecal Coliform	X	X
Willamette River	Biological Criteria	X	X
Willamette River	Toxins	X	X
Willamette River	Dissolved Oxygen	X	X
Winslow Gulch	Dissolved Oxygen		

## Historical and Cultural Resources

People have resided in the SKATS region for thousands of years, long before there were places named Salem, Keizer and Turner. Anthropologists are finding artifacts in the Woodburn area, north of the SKATS area, that indicate a community of people occupied these lands as far back as 12,000 years ago, a civilization that predated any known indigenous people.

When European trappers and traders arrived in the region in the late eighteenth century, the Kalapooya Indian people were using seasonal fires to actively manage the area's vast prairies and savannas for game, bulbs, nuts, seeds and other foods.

The Chemeketa band lived in the Salem area. The Chemawa band lived about ten miles downstream and circulated throughout the area between the Willamette and the Cascades, south of the Molalla River. Their path to the mountains was later used by European-American settlers and eventually became State Street. Both bands, part of the Kalapooya Indian people

and perhaps part of the Santiam tribe, shared winter camp on the Chemeketa prairie where Salem now stands.<sup>4</sup>

Seasonal encampments were located near springs and the sites of historic springs in Salem have yielded the expected detritus remaining from generations of winter camps, including hunting equipment, tools, and cooking equipment. Currently, many cultural resources are intact within the Salem-Keizer area. The location of these is protected by state law.

The city of Salem began as Jason Lee's Methodist mission, founded in 1834. When its initial location flooded, Lee moved north in 1841 to the confluence of Mill Creek and the Willamette River where the missionaries established a school for Indian children. Finding little success educating and converting the few remaining Indians, they disbanded the mission and in 1844 platted a town at a location called Chemeketa by the native people and Salem by the settlers, both meaning "place of peace." They moved the Indian school building to a new location and in 1844 opened a school for their own children called the Oregon Institute, the beginning of Willamette University.

Salem has been the home of the state government since 1851. Development in the city and area has been ongoing since the late 1840s, and there are still a number of buildings and areas that pre-date the 20<sup>th</sup> century. In addition to the 62 houses on the National Register of Historic Places, three historic districts are designated within the Salem city limits: Gaiety Hill/Bush's Pasture Park, Salem Downtown State Street - Commercial Street, and Court Street - Chemeketa Street.

Cultural resources in the area include schools of higher learning, such as Willamette University, founded in 1842, Chemeketa Community College, and Corban College; the State Capitol; and historical areas that have been adapted to provide information on early American settlement in the area, such as Mission Mill and Deepwood Estate.

## General Effects of Transportation Systems

As important as our transportation systems are to moving people and goods through the landscape, they do have a number of direct negative affects on natural systems and their functions. Primarily:

### **1. Roads contribute to stream pollution**

As stormwater moves across the paved surfaces of roads and parking lots two things happen: the temperature of the water increases, and it collects the sediment, oils, and other pollutants that were on the surface. This water is then directed through ditches, pipes, and culverts into the area streams and rivers. Some may be filtered, but much remains untreated. This warm polluted water degrades aquatic systems in which organisms depend upon cold clean water.

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<sup>4</sup> Pringle Glenn-Gibson, Claggett, and Mill Creeks Watershed Assessment, January 2002.

## **2. Roads change the hydrology of their site and areas downstream**

Built of impervious materials, road surfaces prevent rainwater from percolating into the soil and groundwater beneath them. Instead, water hitting the roadway runs off, directed by ditches to underground pipes that lead the water into nearby creeks and rivers at a higher volume and speed than naturally occurs, causing erosion of the stream channel and stirring up silt. In the dry season, with less water having entered the groundwater system, the cool springs that historically fed streams during hot summer days dry up. Streams become “flashy” with more extreme highs and lows.

## **3. Roads fragment wildlife habitat**

Construction of roads can divide a habitat and create challenging barriers to wildlife movement. As a result, animals and birds are killed by collisions with motor vehicles. Where a road crosses a creek or stream, inappropriately designed culverts will act as barriers to fish migration, isolating entire populations either above or below the structure. Building roads across wetlands and other moist sites can disrupt important nesting habitat for turtles, amphibians, and birds.

## **4. Roads contribute to invasive species distribution**

Invasive species are considered the second greatest threat to native fish and wildlife, right behind habitat destruction. Aggressive nonnative plant species can quickly out complete native plant communities, taking over and altering habitat in a very short time, much to the detriment of the wildlife that evolved in concert with them.

Roadways are notorious channels for invasive weed species. Seeds hitchhike on tires, bumpers, or within cargo of trucks and cars, sometimes traveling great distances. As new roads are built, newly disturbed soil provides an open invitation to these species. Appropriate planting and maintenance of road embankments is a critical tool in fighting the progression of these species along road corridors and into our native habitats. Invasive species pose one of the greatest challenges to establishment of effective mitigation projects.

There are other impacts from transportation systems. The most obvious is global climate change. Use of automobiles is widely considered the greatest contributor of greenhouse gases, primarily CO<sub>2</sub>, that are warming the Earth’s atmosphere and changing climate worldwide. Use of transportation systems also contributes to air pollution and noise pollution. Depending on how they are lit, roadways can contribute to light pollution, which has diminished the ability of most urban dwellers to view stars and planets in the night sky. Roads and parking lots add to urban heat island effects, raising air temperatures and exacerbating effects of air pollution.

## **Federal, State, and Local Laws and Regulations**

Management of water quality, water quantity, fish and wildlife habitat, invasive species and historical-cultural areas is directed by federal, state, and local regulations and the enforcement of these regulations is carried out at all three levels of government. The following section highlights the primary regulations that govern activities of local transportation agencies.

## Water quality

The Federal Water Pollution Control Act, popularly called the Clean Water Act, is the primary United States law protecting water quality and the health of the nation's waterways with the objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. As such, it is intended to secure clean water for human consumption and use, as well as prevent deterioration of aquatic habitat in streams, rivers, and wetlands.

Administered by the U.S. Environmental Protection Agency, it requires states to establish approved water quality standards that designate the waters within each state for particular uses. Waters that become degraded by point and non-point sources to the extent that they do not support their designated use are listed as "impaired" at which point the state must establish total maximum daily loads (TMDLs) of pollutants that the water body can receive. These TMDL limitations can significantly restrict those uses of waterways that require permits.

In Oregon, the Department of Environmental Quality administers the Clean Water Act. In September, DEQ published and EPA approved the Willamette River TMDL standards for temperature, bacteria, and mercury. These standards, the first issued for an entire basin, are intended to aid in improving the condition of many water bodies listed as impaired by the agency in 1998 and 2002. This places responsibility on a variety of permit holders including cities and counties to develop plans for complying with the new TMDLs.

Cities and counties in the Willamette Valley received notification in early November 2006 of their status as Designated Management Agencies and were given 18 months to demonstrate compliance with the TMDL standards. Cities with populations of 50,000 and larger (Salem) are required to have stormwater permits to minimize bacteria and other pollutant runoff. These permits will be updated to reflect new information from this TMDL and may require the implementation of more stringent controls for bacteria as necessary. Although Keizer and Turner have populations smaller than 50,000, as part of a metropolitan area they too will need to develop stormwater strategies to minimize the amount of bacteria that will enter streams and rivers, and their plans will be reviewed and approved by DEQ.

Nonpoint pollution sources (urban areas, working farms, and forests) will be required to restore native streamside vegetation to provide localized cool water refuge for fish.

Restoration and protection will be managed through implementation plans that already exist (for example SB 1010 administered by the Department of Agriculture) or through those developed by other designated management agencies. DEQ developed the TMDLs with the recognition that future urban growth will increase stream temperatures. Therefore, half of the heat load is in reserve, to be used when the Corps of Engineers completes analysis of effects of hydroelectric dams on temperature in the Willamette River.

## Waterways and Wetlands

In addition to federal and state protection of water quality, Section 10 of the Rivers and Harbors Act of 1899 makes it unlawful to modify the course of navigable waterways and Section 404(a) of the Clean Water Act directs the Army Corps of Engineers to regulate the release of fill material into rivers, streams, and wetlands. "Wetlands" are defined as those areas that are subject to regular inundation and therefore support the growth of certain kinds of vegetation.

Wetlands serve a variety of functions including water detention that provides aquifer recharge, water purification, flood control, open space and wildlife habitat. Filling, dredging, or otherwise discharging dirt or other materials into wetlands requires a permit. Particularly for larger developments, the permitting process can be complex and can involve participation by EPA, other federal and state agencies, and the public.

Since the early 1990s, broad categories of construction activities that disturb five acres or more, and "medium" and "large" municipal separate stormwater systems, have been required to possess a National Pollutant Discharge Elimination System (NPDES) permit regulating their stormwater runoff. Construction sites of between one and five acres and smaller municipal separate stormwater systems are now subject to such regulation as well. Closely related to, and often overlapping with, stormwater issues are requirements relating to control of erosion and sedimentation. Permitting obligations may include preparation of detailed erosion and sedimentation prevention plans, restoration of stream buffers, and other requirements.

Oregon's wetlands and waterways are also regulated by the Oregon Department of State Lands (DSL) under the state Removal-Fill Law; the Oregon Department of Forestry under the Forest Practices Act; the U.S. Natural Resources Conservation Service under the federal Farm Bill; the Oregon Department of Agriculture, Natural Resources Division; and city and county land use ordinances.

## **Water quantity**

While it is well documented that transportation infrastructure such as highways, roads, and parking lots alter site hydrology, it is challenging to identify regulations that directly address this issue. The Clean Water Act addresses pollutants more than pulses. The Federal Emergency Management Agency maps floodplains and regulates levels of development in floodplains from the standpoint of hazard management. The Oregon Water Resources Department manages ground water withdrawals and surface water rights, but not alterations to site hydrology. Oregon DEQ provides stormwater management direction under the Clean Water Act to control sediment and toxic materials in runoff, not to address the other issues created by impervious surfaces. There does not seem to be a set of regulations that specifically addresses degradation to site and downstream hydrology including steepened stream banks, increased erosion, depletion of springs and groundwater, and reduced summer stream flows. Instead, these issues are being addressed more frequently at a grassroots level, with efforts by local communities to gain the knowledge needed to build programs that effectively retain and restore watershed functions and livability.

## **Habitat**

The Endangered Species Act is the primary federal law dealing with the nation's fish and wildlife populations. Administration of the act is shared by the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration Fisheries Service. The act provides a process for protecting threatened and endangered species and the habitats on which they depend. Species include birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees. The act prohibits any activity that results in a "taking" (killing) of a listed species or adversely affects its habitat. Any action that is expected to result in a taking or habitat

destruction requires a permit and mitigation. Oregon also has an Endangered Species Act that works in concert with the federal law and relegates protection of native plants to the Oregon Department of Agriculture.

## Invasive Species

Management of aggressive nonnative plants is regulated under a variety of laws and executive orders and enforced by many agencies. In 1999, President Clinton signed Executive Order 13112 establishing the National Invasive Species Council and a Council of federal departments. Currently, the 13 departments and agencies on the council are developing a national invasive species plan. The lead agency for invasive plant management is the U.S. Department of Agriculture, which maintains a noxious weed list and is responsible for preventative measures and recovery of endangered wild plants. The Oregon State Department of Agriculture is the primary state agency charged with management of invasive plants. Their strategy for management describes invasive species as a “biological emergency,” while noting that funding for invasive species management has dropped at the state and county level over the past decade. ODA maintains a list of noxious weeds and supports a wide variety of activities for early detection of new infestations, eradication, collaboration, education and funding. Many local jurisdictions participate on local weed boards and jointly develop management strategies. Salem’s noxious weed ordinance focuses on yard maintenance rather than specific invasive species. Marion County created a weed control district and ordinance in March 2006.

SAFETEA-LU includes a provision that makes activities for the control of noxious weeds and the establishment of native species eligible for federal funds. The control of terrestrial noxious weeds and aquatic weeds is commonly done by maintenance districts or contracted crews of each state department of transportation. Historically, maintenance activities have been the responsibility of the state and therefore have not been eligible for federal assistance.

## Historical and Cultural

Protection of historical resources stems from Section 106 of the National Historic Preservation Act of 1966. The management of historic resources is carried out by the State Historic Preservation Office (SHPO) that resides within the Oregon State Parks Department. The SHPO maintains data on historic resources and provides assistance and consultation to agencies and individuals as to the potential for projects to affect cultural or historic resources.

The Oregon Land Use System Goal 5 includes a requirement that cities and counties develop inventories of historical and cultural resources. In addition, the state has enacted a number of laws aimed at protecting historical and cultural resources, the gravesites of indigenous tribes, archaeological sites and objects, scenic waterways, and conservation easements. A complete description of these laws, as well as the federal laws governing cultural and historical resources, is available at SHPO’s website.<sup>5</sup>

The city of Salem zoning ordinance **120A.140. PRESERVATION OF ARCHEOLOGICAL RESOURCES** requires that, “Archeological resources shall be protected and preserved in place

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<sup>5</sup> [http://www.oregonheritage.org/OPRD/HCD/ARCH/arch\\_laws.shtml](http://www.oregonheritage.org/OPRD/HCD/ARCH/arch_laws.shtml)

if at all possible according to the requirements of federal, state, and local regulations, including the guidelines administered by the Oregon State Historic Preservation Office.”

## **Additional Direction and Resources**

These laws and regulations provide the primary baseline standards for addressing environmental impacts from road construction and maintenance activities. There are many other federal and state laws that affect the management of these resources and are intended to prevent or minimize resource damage or destruction. Among these is the National Environmental Policy Act, which defines a procedure for assessing potential environmental impacts on projects involving federal land, federal funds, and/or federal agency permits.

There are currently no federal, state or local regulations that deal specifically with global warming. However, Oregon Governor Kulongowski assembled an advisory committee to provide recommendations and is developing a number of state initiatives to curb greenhouse gas emissions in alliance with the other west coast governors.

Because the SKATS urban area is within one of the most studied basins in the world, several excellent sources of information and recommendations that represent the collective thinking of experts and citizen advisors that have been funded through public as well as private investment are available. The Oregon Department of Fish and Wildlife released the Oregon Comprehensive Conservation Strategy in 2005, a compendium of information and resources on how to take meaningful voluntary action to conserve the state’s biodiversity. The Greater Salem-Keizer Area Watershed Councils developed an excellent comprehensive assessment for the four watersheds of the metro area. The Willamette River Basin Planning Atlas developed by the Pacific Northwest Ecosystem Research Consortium, and published by OSU Press in 2002, assesses the changes within the basin over the past 150 years and projects three alternative futures and their likely effects on basin resources. A complete listing of the resources gathered are presented in **Appendix C**.

## **Current Activities and Practices**

The regional transportation plan is comprised of transportation projects submitted from the jurisdictions within the planning area. The regional system and surrounding landscape and waterways of the SKATS metropolitan area are not planned or managed uniformly but instead vary by jurisdiction based on the priorities, emphasis, and capacity of each community. All of the jurisdictions must meet the basic requirements of federal and state environmental regulations. However, they do this in different ways. The city of Salem and Marion County have natural resource specialists on staff. Keizer is much more limited on staffing. The small community of Turner, considered part of the metropolitan area only by its proximity to Salem, contracts for most of its services. Each jurisdiction also has its own local ordinances and codes. The Oregon Department of Transportation manages four primary thoroughfares through the region – Interstate 5, Highway 22, Highway 221 and the Salem Parkway—drawing upon the resources of a statewide agency.

## Stormwater

Salem, Keizer, and Marion County Public Works staffs include specialists who help them manage water quality and quantity during planning and implementation. This work is currently handled project by project. Salem staff is interested in improving their efforts by identifying a standardized environmental review process. Salem and Keizer staff do not currently collaborate on stormwater management. Historically, public works departments focused on moving stormwater as swiftly as possible off site. Today these jurisdictions recognize the challenges to ecological health posed by impervious surfaces and culverts that disrupt natural hydrological processes. What's more, as newly appointed Designated Management Agencies by DEQ, they are required to meet TMDL standards for bacteria, mercury, and temperature within 18 months.

To do this, Salem is retrofitting existing stormwater drainage systems with mechanical filtration systems that help purify stormwater before it reaches creeks and rivers. Additionally, new requirements call for piping stormwater off of bridges to treatment facilities before releasing it into the river or stream. Keizer is challenged to comply with these same treatment requirements but without the necessary maintenance equipment and with limited staff. Neither Salem nor Keizer currently collects stormwater fees from citizens. However, both cities have recently completed stormwater plans and are anticipating establishing a fee program to pay for the measures that will be necessary to meet TMDL standards including stormwater filtering and monitoring. The cities are open to but have not yet discussed a collaborative approach to meeting TMDL standards.

Keizer has developed stormwater infiltration road projects. These model street projects feature bioswales and pervious surfaces between the roadway and bike path. They are planning another that drains into an improved wetland. Additionally, Keizer seeks opportunities to enhance ecological function on projects developed for other goals. For example, they are creating a wetland on Labish Creek adjacent to a park. In the winter and spring, the three-foot-deep creek that supports beaver and cutthroat trout flows through a ditch with steep banks creating a safety issue for children using the park. The project will widen the creek floodplain, providing a broad shallow area for water to infiltrate and will be planted with native vegetation.

Marion County's Stormwater Management Plan Best Management Practices have been endorsed by the Oregon Watershed Enhancement Board as salmon and habitat friendly. The plan can be viewed on the Marion County Public Works website.

## Mitigation

Local communities all mitigate for damage to streams and wetlands. Salem and Marion County purchase wetland credits from one of three private banks serving the Salem area. Keizer has not used banks so far. Marion County has developed its own wetland bank in Parkdale Park next to Stevens Middle School that provided mitigation for a road widening project and when restored will produce more credits than were needed. The middle school students have adopted the wetland and use it to enhance their curriculum. The county environmental staff see potential for expanding private wetland banking, as there are interested local landowners. The

Department of State Lands limits their approvals of banks to maintain the demand for those banks already approved and operating so as to not flood the market with credits. Currently three banks serve the SKATS area: Marion, Weathers and Rickreall. According to DSL, Marion is not selling credits as of this writing because of an invasive weed issue that they are working to resolve. Two credits are available at the Weathers bank, while Rickreall has 20. Banks are often the preferred method of mitigation ecologically because they focus investment on larger higher value sites providing better habitat and other ecological services. Project managers often prefer purchasing credits from a bank as well because it is faster than creating a mitigation site, and the banker holds the liability for success of the site's restoration.

Salem is developing a proposal for stream banking that would open opportunities for restoring larger stretches of the city's riparian corridors. The proposal is welcomed by DSL and still must meet U.S. Army Corps of Engineers approval.

Oregon Department of Transportation has developed a conservation banking program that trades endangered species habitat. This program measures the debits (habitat damage at the project site) and credits (restoration success at the bank site) in terms of habitat value rather than feet of stream bank or acres of wetland, and thus a credit can address multiple resources and regulations. This approach is expected to conserve habitat much more effectively. ODOT is developing two bank sites in the mid Willamette Valley as mitigation exclusively for ODOT projects.

Marion County also mitigates for endangered species habitat.

## **Invasive species**

In March 2006, Marion County Commissioners approved funding and authority to form a weed board. They passed an ordinance that defines the county's approach to managing aggressive nonnative plants.

The city of Salem has a noxious weed code that deals with aesthetics such as vegetation height, but not species. There appears to be no overall policy regarding invasive species management.

## **Historical and Cultural**

The city of Salem has a Historic Landmarks and Design Review Commission that oversees the city's historic preservation activities including nominations of historic resources and review of city codes and ordinances pertaining to historic resources.

Planners from each of the jurisdictions confer with the SHPO on a project-by-project basis to identify and implement appropriate measures to avoid, minimize, and mitigate for disturbance of historic resources.

All projects that are federally funded, or have permits issued by a federal agency, are required to undergo a section 106 review by the SHPO office.

## Comparing the Projects to the Resources

SAFETEA-LU requires SKATS to compare the projects identified in the RTSP to maps and other data sources that describe the natural and cultural resources that are within the Plan's study boundary. This comparison will help inform regional and local staff regarding which of the proposed projects could have potential effects on the nearby natural and cultural features.

In most cases, early identification of natural, historical, and cultural resources located in or near proposed project right-of-ways will allow for the modification of the project's scope to avoid potential impacts. In cases where this is not possible, activities will be developed to minimize any possible impact. If these are insufficient, mitigation processes will need to be implemented that offset the loss caused by the project.

Data describing the natural, historical, and cultural resources in the SKATS area were collected from a variety of sources, including city, county, state, and federal resource agencies. A complete list of the data gathered is presented in **Appendix C**. The data were in the form of maps, plans, assessments, and GIS layers covering one or more of the resources of interest. This data is not uniformly distributed, rather there is more information regarding the natural resources, and in particular fish and water that are subject to national laws such as the Endangered Species Act or the Clean Water Act. Information on the historical and cultural resources present in the SKATS area is more limited.

The cities and counties are required to maintain inventories of historic sites and districts under Goal 5 of Oregon's land use laws. In addition, the State Historical Preservation Office (SHPO) manages official data on the location and condition of cultural and historic resources. Archeological and other sites dealing with the inhabitants before European settlement are considered by the State Historical Preservation Office as confidential data, in order to prevent the sites from being disturbed or vandalized. Currently, the only information that is publicly and readily accessible in a format ready for comparison with the location of transportation projects describes where the historic districts are located in the city of Salem, and the location of buildings listed on the National Register of Historic Places. Because of the confidentiality of archaeological records, it is the recommendation of SHPO that transportation managers and planners continue to address conservation of these resources project by project. SHPO plans to make the Oregon Historic Inventory available on their website in the near future, which should allow for a more complete comparison of historic resources with the projects in the long-range plan.

Data on the natural resources in the SKATS area provides a rather well defined look at the waterways, as well as some of their inhabitants, namely the threatened fish. This level of specificity is not matched for the terrestrial plants and animals in the area, nor for many of the other species occupying the waterways. While historic documents provide information on the make-up, and to a degree, extent of the land cover at the start of Euro-American settlement, similar information reflecting the existing conditions is not as detailed. Satellite imagery and aerial photography provide a coarse delineation of the land between pervious and impervious surfaces, but do little to assist in determining the on-ground nuances. Many of the plans and assessments that were gathered do little to ameliorate this situation, and will require the effort of numerous organizations and jurisdictions over many years to develop the data describing the

terrestrial and non-listed aquatic species to the same level of detail as that of the aquatic species protected by the Endangered Species Act.

Also available in several of these plans, and specifically in the Conservation Strategy produced by Oregon Department of Fish and Wildlife, are recommendations of areas where work should be focused to restore and maintain the environmental conditions to provide a foundation for future work. These areas, such as the floodplain of the Willamette River and the along the tributaries that feed into it, are areas where development of transportation projects should take special care to ensure that as little as possible is disturbed.

The RTSP includes many types of projects identified as being necessary to maintain the multi-modal mobility needs of the region’s residents and businesses. For a complete discussion of the project categories included in the RTSP, see chapter 15. A complete list of the projects included as part of the financially constrained RTSP is available in **Table 15-1**. These projects have different impacts on the natural environment, ranging from slight or none to habitat destruction. The potential for impacting the environment by category of the modification to the facility is shown in **Table 16-3**. Obviously, the potential is location dependent; in an area with sensitive habitats even the most benign project may have more of an impact than in an area with no habitats.

**Table 16-3  
Project Types and Impact Potential**

Project Type	Potential Impact
Bridge – new or replacing	●
New road	●
Widen existing road (add travel lanes)	◐
Widen intersection	◐
Add turn lanes/center lane	◐
Adding bicycle lanes	◐
Adding sidewalks	◐
Signals & signal interconnects	○
Purchasing buses	○

## Analysis of Data

A critical part of the analysis is determining which features to examine in relation to the transportation projects. This was influenced by the availability of data and the significance of the resource. Natural resources such as steelhead trout and chinook salmon that are listed as endangered by NOAA Fisheries meet both criteria, as the data on their habitats is readily available and the need is great. Data was obtained from NOAA Fisheries describing the critical habitat for steelhead trout and chinook salmon. The Endangered Species Act defines critical habitats as:

“(1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those

features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation.”<sup>6</sup>

In addition, data from the Oregon Department of State Lands (ODSL) on essential salmonid habitat was gathered. ODSL has defined essential salmonid habitat as “... as the habitat necessary to prevent the depletion of native salmon species (chum, sockeye, chinook and coho salmon, and steelhead and cutthroat trout) during their life history stages of spawning and rearing.”<sup>7</sup>

For the initial analysis comparing natural and historic resources with the projects contained in this Plan, information on the critical and essential habitat was used, as well as information on the location of historic districts and the buildings listed on the National Register of Historic Places, wetlands identified from the Local Wetland Inventory, and waterways that do not comply with the Clean Water Act as defined by Oregon DEQ in 2002 in their 303(d) list.

The data collected from the local jurisdictions, as well as state and federal resource agencies, was entered into a geographical information system (GIS), which also contained information on the location and type of projects included in the Plan (see chapter 15). The GIS was used to perform a spatial analysis that displays where a project intersects or is within a given distance of a particular natural or historical feature, such as a waterway. For projects where the work is performed in one location, such as modifying an intersection or reconstructing a bridge, a distance of .05 mile was used for the analysis. For “corridor” projects, or where the modification is longer than an intersection or bridge span, such as reconstructing a road to include a center turn lane, a GIS *intersection* was performed, which shows where the projects cross the resources being considered. When comparing the corridors with the wetlands coverage, an *intersection* was not performed; instead the GIS was used to determine whether the project was within .005 mile of a wetland. This procedure was used due to an artifact in the wetlands coverage; it did not show the wetland going under the road.

Based on this analysis, it was determined that 26 of the 133 projects have a potential direct or indirect impact on one or more of the natural or historical resources of interest. (See **Table 16-4**). There are a number of projects that have potential impacts on more than one resource. Typically, waterways that are listed as critical habitat for steelhead trout and chinook salmon are also listed as essential habitat as well. In particular, Mill Creek has nine eleven projects that cross it in some manner, mainly bridge projects. Nine projects included in the financially constrained plan potentially cross, or are within .005 mile of a wetland identified in the Local Wetland Inventory (see **Map 16-1**). There are no known direct impacts to historic buildings on the National Register of Historic Places, and one project crosses through a historic district (see **Map 16-2**).

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<sup>6</sup> <http://www.nwr.noaa.gov/Salmon-Habitat/Critical-Habitat/Index.cfm>

<sup>7</sup> <http://www.oregon.gov/DSL/PERMITS/esshabitat.shtml>

## Strategies for Minimizing Impacts

The population of the SKATS area is expected to increase by 39 percent by 2031, placing pressure on land uses and transportation systems throughout the region. The region needs to develop strategies and activities to minimize the impact of transportation projects on the environment. Given that budgets for transportation planning, construction, and maintenance are pinched already and concerns for global warming are on the rise, it would benefit the jurisdictions of the region to continue to support and enhance existing policies or strategies and develop new ones that reduce use of automobiles and encourage use of mass transit, carpooling, walking, bicycling, and telecommuting. Many of these strategies are discussed in Chapter 13 and are promoted in the SKATS area, as well as the surrounding area, by the Mid-Valley Rideshare, which is administered by the Transit District.

### Avoid, Reduce, Mitigate

One of the most effective ways to reduce costs, benefit the environment, and manage complex regulatory issues is to consider options at the outset that can reduce or eliminate environmental impacts and thus regulatory requirements. The Clean Water Act requires that those proposing projects focus first on avoiding impacts to water resources that may impact wetlands, streams, or rivers. Considering location and landscape features early in project placement and design can reduce the negative effects of construction activities and ultimately the use of a given

**Table 16-4**  
**Projects with Potential Impacts**

RTSP ID	Name	Type	Category	Location	Intersection or Corridor	Critical Salmon	Essential Salmon	303d	Historic	Wetlands	Resource
K003	Chemawa Rd NE: River Rd to Verda Ln NE	Bridge	Committed	Chemawa Rd NE from River Rd N to Verda Ln NE	Corridor					X	Wetland
K017	Chemawa Rd Upgrade (Keizer Rapids)	Urban Standards	Committed	Chemawa Rd from River Rd N to Keizer Rapids Park	Corridor					X	Wetland
M003	Cordon Rd NE: State St to Silverton Rd NE	Signals & Interconnects	Committed	Cordon Rd NE from State St to Silverton Rd NE	Corridor					X	Wetland
O013	I-5: Mill Creek - Mill Creek Overflow Fish Passage	Environmental	Committed	I-5 & Mill Creek	Intersection	X	X	X			Mill Creek
S025	12th/13th St SE (Mission and Hoyt)	Signals & Interconnects	Committed	12th and 13th St SE between Mission St SE and Hoyt St SE	Corridor		X	X			Pringle Creek
S026	17th St NE: State St to Market St NE	Signals & Interconnects	Committed	17th St NE from State St to Market St NE	Corridor	X	X	X	X	X	Mill Creek, Court St-Chemeketa St Historic District
S028	25th St SE Bridge & Shelton Ditch	Bridge	Committed	25th St SE at Shelton Ditch	Intersection		X				Shelton Ditch
S035	Cottage St: Mill Creek Bridge (HBRRL)	Bridge	Committed	Cottage St @ Mill Creek	Intersection	X	X	X			Mill Creek
S049	Liberty St NE Bridge & Mill Creek	Bridge	Committed	Liberty St NE @ Mill Creek	Intersection	X	X	X			Mill Creek
S050	Madrona Av SE: Pringle Rd Se to Fairview Industrial Dr SE	Signals & Interconnects	Committed	Madrona Ave SE from Pringle Rd SE to Fairview Industrial Dr SE	Corridor			X			Pringle Creek
S055	State St Bridge & Mill Creek	Bridge	Committed	State St at Mill Creek	Intersection	X	X	X			Mill Creek
S073	Capitol St NE at Mill Creek	Bridge	Committed	Capitol St NE at Mill Creek	Intersection	X	X	X			Mill Creek
S126	McGilchrist St SE: 12th St SE to 25th St SE	Urban Standards	Committed	McGilchrist St SE: 12th St SE to 25th St SE	Corridor			X			Pringle Creek
S272	Marion St Bridge Signal Interconnect	Signals & Interconnects	Committed	From downtown to west Salem via the Marion St bridge	Corridor	X	X	X		X	Willamette River
S274	Salem Industrial Dr Improvement	Urban Standards	Committed	Salem Industrial Dr NE from Cherry Av NE to Bill Frey Dr NE	Corridor					X	Wetland
T001	3rd St & Denver St : Turner	Efficiency	Committed	3rd St to Denver St in Turner	Corridor	X	X	X			Mill Creek
S244	Union St RR Bridge Conversion	Bicycle	Committed	Union St RR Bridge	Corridor	X	X	X			Willamette River
B001	HPTC Corridor Improvements	Transit	Included	Various locations on the HPTC corridor	Corridor	X	X	X			Mill Creek
M011	Auburn Rd NE: Lancaster Dr NE to Cordon Rd NE	Urban Standards	Included	Auburn Rd: Lancaster Dr to Cordon Rd	Corridor					X	Wetland
M014	Center St NE: Greencrest Dr NE to Cordon Rd NE	Urban Standards	Included	Center St NE from Lancaster Dr to Cordon Rd	Corridor					X	Wetland
S080	Commercial St & Pringle Creek	Bridge	Included	Commercial St SE at Pringle Creek	Intersection		X	X			Mill Creek
S101	Hawthorne Ave NE & Hyacinth Rd NE: Portland Rd NE to Sunnyview Rd NE	Urban Standards	Included	Hawthorne Ave NE & Hyacinth Rd NE: Portland Rd NE to Sunnyview Rd NE	Corridor					X	Pringle Creek
S110	Kuebler Bv SE: Turner Rd SE to Hwy 22 Overpass - SREC	Capacity Increasing	Included	Kuebler Blvd from Turner Rd SE to Hwy 22 overpass	Corridor	X	XX	X			Mill Creek
S115	Liberty St & Pringle Creek	Bridge	Included	Liberty St SE at Pringle Creek	Intersection			X			Pringle Creek
S145	Summer St & Mill Creek Bridge	Bridge	Included	Summer St NE at Mill Creek	Intersection	X	X	X			Mill Creek
S165	12th St SE: McGilchrist St SE to Fairview Av SE	Capacity Increasing	Included	12th St SE from McGilchrist St SE to Vista St SE	Corridor			X			Clark Creek

facility, whether street, road, or bridge. Thoughtful planning to reduce erosion and sedimentation, impervious surface and other infiltration impediments, and wetland and stream impacts can eliminate the need for permits, saving time, money, and environmental degradation.

## **Strategy 1: Enhance Wetland Banking**

When impacts are unavoidable, there are a number of ways to improve the value of project mitigation. Traditionally, mitigation has been on a project-by-project basis to replace the same type of resource that was impacted by the development. Two resources that have been mitigated in the past in the SKATS area are wetlands and streams. Currently, three private wetland mitigation banks serve the Salem area. It may be beneficial for the SKATS region to develop wetland or conservation banks to be used for public and or private development mitigation as the area develops. The first step in determining the desirability of banking is to calculate the scale and type of development and the commensurate need for mitigation over the next several decades. Then, a determination of the number of credits that are likely to be coming online during that period and their anticipated costs will be made. If the number of credits required is equal to or greater than the number of credits available at the existing banks, it may be in the region's interest to develop a regional mitigation bank for all future projects.

## **Strategy 2: Establish stream bank mitigation banking**

Currently, the Department of State Lands and US Army Corps of Engineers require that when a project impacts a stream, the project owner (either the city or a private developer) must restore the adjacent 150-foot section of stream. The city or developer is then required to maintain that section for five years. One possible downfall of this policy is that it can create 150' pockets of restored but isolated habitat that are adjacent to weed patches. Salem instead wants to take a new approach wherein a broader range of mitigation needs can be met by restoring the city's streams at key sites. Salem staff has stated that most city stream impacts cannot be mitigated elsewhere.

Traditional wetland banks, run by the private sector under the direction of DSL, offer credits that can be purchased from a landowner who has restored a wetland on his/her private property. The purchase of these credits offsets or compensates for wetlands destroyed within the project area. The Salem stream banking proposal is similar, but instead of the restoration activities taking place outside the city, the mitigation credits would be purchased from the city and the restoration investment would be made on the city's own riparian areas.

It may be challenging to get natural resource agency buyoff because the mitigation would likely be made for damage to a variety of resources, not just streams. So far, the regulatory agencies have generally frowned on this because they want to trade resource for like resource. In other words if you damage a wetland you replace or buy comparable wetland. In this case, there may be some trading of wetland impact for stream habitat. Nonetheless, DSL is eager to receive the city's proposal. The first stream banking project was in Missouri. Today, there are perhaps as many as two dozen operating in the U.S.<sup>8</sup>

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<sup>8</sup> Katoomba Group Ecosystem Marketplace Website, [http://ecosystemmarketplace.com/pages/article.news.php?component\\_id=699&component\\_version\\_id](http://ecosystemmarketplace.com/pages/article.news.php?component_id=699&component_version_id)

### Strategy 3: Consider Conservation Banking

Thus far, there are few opportunities for conservation banking in Oregon. ODOT has developed a program in which they hope to mitigate for a variety of resources on several high value sites they have purchased throughout the state. At present, they are developing methods for valuing credits and creating the “currency” for these banks, a challenging endeavor. It would be wise for the SKATS region to explore possible collaboration with ODOT, and certainly to explore the model that ODOT is developing. Once again, the jurisdictions within the region need to collectively assess their anticipated growth and mitigation need and make a cost/benefit analysis.

### Strategy 4: Wildlife connectivity

Over the past decade there have been many innovative approaches taken in constructing transportation systems to prevent negative effects on wildlife. Transportation planners have teamed with wildlife researchers to develop structures that help terrestrial wildlife cross roads, ranging from overpasses and underpasses to open-bottom culverts that function much like natural streambeds. In the SKATS area as in much of Oregon, transportation agencies are systematically removing barriers to fish migration. However, according to the Oregon Department of Fish and Wildlife, the Salem-Keizer area will be hampered in providing wildlife habitat connectivity so long as there is no detailed species and habitat inventory for the metropolitan area. Such an inventory can help the region prioritize key habitats and natural areas and identify linkages and corridors to wildlife migration for both large and small species. State and federal wildlife management agencies encourage transportation planners to consult with them early and throughout project planning to identify need for accommodating wildlife movement and avoid other impacts to habitat.

## Outstanding Issues and Proposed Actions

The process of comparing the regional transportation plan with the natural resources of the SKATS area provided an opportunity to assess the current approaches and practices of member jurisdictions as well as the effects of the plan. While discovering the many positive and innovative actions taken by members, several issues became apparent that present obstacles to better resource management. The following is a brief listing and recommended voluntary actions.

**Issue:** Land Use Planning and Public Works departments tend to operate separately, in part because there is the perception that Planning manages private development and Public Works (including Transportation) manages public development. This structure can serve as an impediment to creating a citywide, countywide, or regionwide approach to strategic investment in the region’s ecological infrastructure. Although most land development takes place on private property, the public has an interest in the form that development takes and how it affects community livability. These departments ideally should work together to direct

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protection of ecological systems, high priority natural areas and landscape features, and help focus investments in high priority mitigation efforts.

**Issue:** Transportation and land management planning staff face challenges in applying research results and broad scale conservation strategies to local issues and projects. They are encouraged to tap a vast quantity of data and research results but often lack the knowledge, time, or staff to make effective use of this information. Instead, they rely on current regulations to direct conservation efforts.

**Issue:** There are limited protections for some of the most threatened natural systems in the SKATS area. Oregon White Oak savannas and western Oregon native prairies are among the most threatened ecosystems in North America. Most of the metropolitan area was covered by these systems before Euro-American settlement. Yet, unless they contain species listed under the Endangered Species Act, there is limited federal or state protection for these vegetation communities. Salem's tree ordinance specifically addresses conservation of white oaks. In Salem, tree protection is found in three different sections of the city code, making enforcement challenging.

**Issue:** Due to the confidentiality of archaeological records, projects currently have to address conservation of these resources on a project-by-project basis, typically late in the process. While this process works for individual projects, it would likely breakdown when considering the number of projects in either the RTSP or TIP.

**Action:** Identify key natural features, systems, and functions. Prioritize these places and functions so that land use and transportation planners can avoid impacts and invest mitigation dollars and other funding in highest value areas.

**Action:** Establish a process for greater collaboration between land use and transportation planners and managers from various jurisdictions within the midsection of the Willamette Basin. Currently, information about creative and progressive projects and approaches does not seem to be widely shared between jurisdictions. Partnerships would likely result in cost savings, opening opportunities for improved projects and conservation efforts.

**Action:** Develop educational programs that help planners and managers gain greater understanding of ecological systems and impacts of land use and transportation. Build a bridge between large-scale strategies for protecting biodiversity and local land management issues and projects. Explore partnerships with the Mid Willamette Valley Council of Governments, League of Oregon Cities, Association of Oregon Counties, OSU Extension Service, Soil and Water Conservation Service, and Oregon Chapter of the American Planning Association to develop and deliver training and assistance.

**Action:** Consider partnering with state agencies, non-governmental organizations such as the Nature Conservancy, and others to develop a process that local planners can step through to evaluate the effects of a given project or whole program on ecological systems.

**Action:** Oregon Department of Transportation archaeologist Carolyn McAleer offered an approach to addressing historic and cultural resources at the regional scale. The cities of Salem,

Keizer, and Turner along with Marion and Polk counties and perhaps ODOT could invest in a cultural resources assessment. This would entail hiring a consulting licensed archaeologist who would have access to SHPO data and other historic and prehistoric records for the SKATS region. He or she would provide an assessment of the cultural resources within the metropolitan area and strategies for avoiding key sites and resources. This would provide SKATS, member jurisdictions, and other regional planning entities with advance knowledge of key resource sites well ahead of project planning, enhancing opportunities for avoiding disturbance of sites and costly plan changes or mitigation.

The data gathered and the procedures developed represent the region's first attempt to compare the regional transportation plan to the region's natural resources. As such, this process is envisioned as being iterative, with data on the natural, historical, and cultural resources being updated as appropriate, and the project data changing to reflect the projects that are being added, deleted, or modified in the Plan. Results from the strategies put in place should be tracked to determine their effectiveness. As the Plan is updated every four years, data and strategies will be revisited at least on that time frame.

Further discussion with local jurisdictions and resource agencies is necessary to determine which strategies for mitigation are most appropriate for the SKATS area and where they should be carried out for the maximum positive result to the environment. Areas including the Willamette River basin and along the waterways listed as critical habitat for chinook salmon and steelhead trout will likely be among the forefront.

