CHAPTER 4 LAND USE ANALYSIS

State guidelines for Shoreline Master Program (SMP) updates require that local jurisdictions analyze current and projected shoreline use patterns and trends and identify potential conflicts (WAC 173-26-2013)(d)(ii)). Chapters 5-9 of Volume 1 and Chapters 1-7 of Volume 2 characterize the following:

- Current use patterns;
- Public access opportunities;
- Future land use as defined by the County’s Comprehensive Plan; and
- Characterization of shoreline ecological processes, functions, and opportunities for restoration.

The general policy goals of the Shoreline Management Act (SMA) provide for protection of shoreline ecological functions while allowing for “all reasonable and appropriate uses.” The SMA states:

Alterations of the natural condition of the shorelines of the state, in those limited instances when authorized, shall be given priority for single family residences and their appurtenant structures, ports, shoreline recreational uses including but not limited to parks, marinas, piers, and other improvements facilitating public access to shorelines of the state, industrial and commercial developments which are particularly dependent on their location on or use of the shorelines of the state and other development that will provide an opportunity for substantial numbers of the people to enjoy the shorelines of the state (RCW 90.58.020).

This chapter focuses on anticipated trends and projected demand for shoreline uses and potential use conflicts. Potential conflicts in this context are focused on competing objectives or planning priorities inherent in the overall SMA policy intent (e.g., preference for water-dependent uses, public access, and ecological protection and restoration). Potential conflicts may also address conflicts between SMA policy objectives and other interests or regulatory requirements affecting shoreline resources (e.g., levee vegetation maintenance vs. restoration of riparian vegetation).

4.1 Trends and Future Demand

The evaluation of trends and future demand for shoreline uses is based on the technical report prepared by BST Associates (2010) and included as Appendix E. The BST report inventoried the current supply and assessed the future demand for commercial and industrial waterfront uses in Clark County. This assessment focused on water-dependent uses, which are generally located within the Ports of Vancouver, Camas-Washougal and Ridgefield. The report also evaluated the supply of and demand for recreational boating facilities, including marinas, boat launches, and dry boat storage.
4.1.1 Shoreline Development and Trends

4.1.1.1 Existing Water-dependent Uses

The assessment of development trends included a review of past development and existing operation of port facilities and recreational boating facilities. This discussion of trends focuses on existing commercial and industrial water-dependent uses. Waterborne navigation in Clark County occurs primarily on the Columbia River and its connecting channels. A variety of water-dependent uses are currently located on the Columbia River in Clark County or are being planned, including cargo terminals, industrial sites, marinas, private moorage, parks, and mixed use developments. Figure 4-1 shows the location of each of these facilities.

Figure 4-1. Location of Water-dependent Uses in Clark County

Deep-draft ships are able to reach facilities on the Columbia River as far upstream as the I-5 bridge in Vancouver. Above the bridge, a channel is maintained for barges and other shallow-draft traffic. The entire Columbia River waterfront in Clark County is within one of three port districts. The waterfront jurisdiction of the Port of Camas-Washougal begins at the Clark County-Skamania County line and continues downstream to the western boundary of the City of Camas. The waterfront jurisdiction of the Port of Vancouver adjoins the Port of Camas-Washougal on the east, and continues downstream to approximately NW 179th Street, where it adjoins the Port of Ridgefield. The waterfront jurisdiction of the Port of Ridgefield continues downstream to the Lewis River (Figure 4-2).
The following sections provide a summary of existing or planned water-dependent uses on the Clark County waterfront. The analysis starts at the confluence of the Lewis River with the Columbia River, and continues upstream along the Columbia River to the Skamania County line. The following sections are summaries of the descriptions found in the BST Technical Report (2010). Refer to Appendix E for more detail.

**Ridgefield Area**

The Ridgefield area is located in northwest Clark County, along the banks of Lake River. Prominent waterfront uses include the Port of Ridgefield and McCuddy’s Marina. The Port of Ridgefield owns the only waterfront industrial property within its jurisdiction. This property is the 40-acre Lake River site, which was formerly the location of a wood treatment plant.

The Port is planning development of the Lake River property (called Miller’s Landing) to serve as a center for businesses and to accommodate the large and growing numbers of visitors and users. The plan would include approximately 820,000 square feet of building space, serving office, light industrial and possibly residential uses.
Port of Vancouver

Port of Vancouver facilities include: a grain elevator, Terminal 2 (breakbulk, dry bulk and liquid bulk), Terminal 3 (breakbulk) and Terminal 4 (auto terminal and a lay berth). The Port also plans to develop Terminal 5 (former site of Evergreen-ALCOA aluminum smelter) and Columbia Gateway. There are also two private terminals located between Columbia Gateway and Terminal 5 (Hickey Marine Enterprises and Tidewater Barge Vancouver Terminal).

Interstate 5 Bridge to Interstate 205 Bridge

The shoreline between the two interstate highway bridges contains a wide mix of uses, including heavy industry, residential, and recreational uses. There are a number of industrial users of waterborne transportation. As illustrated on the following map (Figure 4-3), one of the frequent uses of the shoreline is for private docks associated with single family homes, or groups of homes.

Figure 4-3. Overview Map of I-5 to I-205

Vancouver to Washougal

Between Vancouver and Washougal there are at least 27 private moorages. The majority of these private docks are associated with individual homes, but some have multiple slips and belong to homeowner groups. Steamboat Landing Marina includes approximately 153 slips, ranging in length from 20 to 40 feet, and with some end-ties for longer boats. Kiewit Construction owns approximately 13 acres on the Columbia River, located just east of the city of Vancouver boundary. Most of the site is leased by Columbia Vista Corporation for use as a sawmill under a long-term contract.
Camas/Washougal

The stretch of shoreline between the I-205 bridge and the Skamania County line contains a mix of uses. A large share of this shoreline is residential, and contains numerous houses with private docks. There are also two marinas, a public boat ramp, and a waterfront park. In addition, there are several industrial users, including the Georgia-Pacific Camas Mill and Hambleton Lumber Company located at Camas.

4.1.1.2 Market Trends

In general, the deep-draft ports in the lower Columbia River have experienced continuous growth during the past 45 years. From 1962 through 2007 (the last year for which data are available), waterborne cargo volumes on domestic and international routes grew at a compound annual growth rate of 2.9 percent. Imports and exports averaged growth of 4.9 percent and 4.3 percent per year.

Trends for growth in water-dependent commercial and industrial uses are based on trend forecasts of the markets for various types of cargoes that are handled by the ports. The discussion of trends is complicated by the fact that port operations in the lower Columbia River include the other Washington and Oregon ports. Therefore, these forecasts are described for the entire lower Columbia River with the assumption that port facilities in Clark County will have a share of the activity.

Forecasts are presented for two scenarios. The first is the baseline forecast, which is a trend forecast of existing commodities and markets. The second, the high growth forecast, includes additional market opportunities. Table 4-1 below provides past performance and forecast scenarios for these cargo types.

<table>
<thead>
<tr>
<th>Cargo Type</th>
<th>Current Level</th>
<th>2030 Forecast (BST, 2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Baseline Level</td>
</tr>
<tr>
<td>Containers</td>
<td>180,000 TEU1’s (2009)</td>
<td>394,000 TUEs</td>
</tr>
<tr>
<td>Automobiles</td>
<td>466,000 units (2008)</td>
<td>989,000 units</td>
</tr>
<tr>
<td>Breakbulk Cargo2</td>
<td>2.5 million tons (2008)</td>
<td>2.7 million tons</td>
</tr>
<tr>
<td>Grain and related Products</td>
<td>19.2 million tons (2008)</td>
<td>21.0 million tons</td>
</tr>
<tr>
<td>Dry Bulk Cargo3</td>
<td>9.2 million tons (2008)</td>
<td>9.8 million tons</td>
</tr>
<tr>
<td>Liquid Bulk4</td>
<td>7.3 million tons (2008)</td>
<td>8.8 million tons</td>
</tr>
</tbody>
</table>

1 Twenty-foot equivalent unit (TEU) is a measure of a ship’s cargo-carrying capacity. One TEU measures twenty feet by eight feet by eight feet - the dimensions of a standard twenty-foot container.
2 Agricultural, metal (steel and aluminum et al.) and forest products (lumber, pulp, paper, plywood et al).
3 Soda ash, potash, bentonite clay and copper concentrates, among other products.
4 Refined petroleum products, fertilizers and chemicals as well as crude oil bound for a Portland asphalt plant.
4.1.1.3 Existing Supply of Marine Terminal Space

The lower Columbia River ports at Portland and St. Helens in Oregon, and Longview, Kalama and Vancouver in Washington, currently have approximately 1,700 acres of developed marine terminal space.

Between 1974 and 2010, there have been 1,297 acres developed into large marine terminals at ports on the lower Columbia River. During this 36-year period, annual development averaged 36.0 acres, which amounts to one 100-acre terminal approximately every three years. During this period, auto terminal development accounted for 402 acres (31 percent of total terminal development) followed by dry bulks (300 acres, 23 percent of total), grain (251 acres, 19 percent of total), containers (220 acres, 17 percent of total), and breakbulk (124 acres, 10 percent of total).

Portland accounted for 719 acres of terminal development and expansion (55 percent of total terminal development) followed by Kalama (200 acres, 16 percent of total), Longview (148 acres, 12 percent of total), St. Helens (110 acres, 9 percent of total), and Vancouver (100 acres, 8 percent of total).

4.1.2 Demand for Water-dependent Uses

Demand for water-dependent uses is estimated based on the inventory of marine terminal space as described in Section 4.1.1.3, and an understanding of future trend in cargo markets as described in Section 4.1.1.2. The growth in any of these markets will drive the demand for operations to expand. According to the BST report (Appendix E), the need for marine cargo terminal space in the lower Columbia River region appears to be as follows.

Containers

There appears to be sufficient capacity at the Port of Portland to meet the region’s marine terminal requirements. If Portland attracts additional container traffic from non-regional locations (new intermodal service), it could require additional acreage at Port of Vancouver Terminal 6. (Refer to Appendix E for more detailed discussion of demand at Port of Vancouver.)

Breakbulk Cargo

The baseline and high growth forecasts for breakbulk are unlikely to exceed existing terminal capacity in 2030. It is unlikely that another terminal would be required, but the existing terminals would need to be improved via higher efficiency or expansion into adjacent acreage. The Port of Vancouver is currently developing space at Terminal 5 to meet the needs for wind turbine customers. Additional expansions may also be required.

Grain

The existing capacity for grain exports is not expected to be exceeded under either the baseline or high growth scenarios. The new terminal being developed in Longview (owned by Bunge and Itochu) has a stated capacity of eight million tons. There could be a shift of grain from other ports (lower Columbia River, Puget Sound or U.S. Gulf) to Longview. Some of the existing
terminals (private and public) on the lower Columbia River are old but have been improved to increase capacity.

Dry Bulk Cargo

The region’s capacity for large-scale dry bulk terminals could experience a shortfall under the baseline and high forecast scenarios. Improvements to existing terminals (increased productivity and/or expansion) could meet this need.

Autos

Auto terminal capacity is expected to be exceeded under the baseline and high growth forecast scenarios. There is an apparent demand for 100 to 300 additional acres of auto terminal space. Demand for auto and breakbulk capacity appears most likely to exceed capacity. The Port of Vancouver could fully develop Terminal 5 by 2030 and begin to develop the Columbia Gateway facility to meet demand. In addition to the cargo types listed above, there are also opportunities for new cargoes. Likely candidates include coal, iron ore and like bulk materials that could range from two to four million tons per year by 2030. If a new major bulk commodity group were attracted to the region, it would require a new terminal of approximately 120 acres per major user.

4.1.3 Residential Development

The use of lands for residential development in the state is controlled and regulated by the Growth Management Act (GMA), which is implemented locally through individual comprehensive plans. The comprehensive plans for incorporated cities and towns are tiered from countywide planning policies that are developed first. The land use plan including the County’s Comprehensive Plan and implementing development regulations apply only to the unincorporated portion of the county. Development within the incorporated areas is regulated by the individual city or town land use plan and development regulations.

According to GMA, growth should be focused in urban areas where urban services already exist or can be reasonably extended. To accommodate this growth, urban growth areas (UGAs) have been designated for each city. These areas include incorporated areas and adjacent unincorporated areas large enough to accommodate forecast growth. The County’s Comprehensive Plan specifies that within urban areas, urban style and density development should occur. Within rural areas, rural style and lower density development are planned.

Approximately 82 percent of the housing units in Clark County are located in UGAs, and 71 percent of housing units are single-family units (Clark County, 2003). The Comprehensive Plan has planned for an adequate amount of land designated for urban residential use, which is sufficient to accommodate the projected population increase of 147,278 persons in Clark County and its cities (Clark County, 2003).

Within the shoreline planning area of the County’s UGAs, approximately 3,984 acres are classified as vacant. Of these lands, 542 acres are planned for single-family residential use. Within the unincorporated areas of the County, approximately 8,422 acres of the shoreline planning area is classified as vacant and 1,584 acres of that is planned for single-family
residential use. At a rural density of one unit per five acres, that would provide capacity for 300 homes in the unincorporated shoreline planning areas.

Based on a density of four units per acre in the UGAs, 542 acres would provide capacity in the shoreline for 2,160 single-family homes in the incorporated areas. Based on past patterns of residential development, current capacity and expected growth, it is likely that there is adequate capacity for residential development in appropriate shoreline areas. It is important to note that these estimates do not take into account redevelopment potential or multi-family development that could increase the capacity for residential use of the shoreline.

There are three houseboat communities located in Clark County (see Figures 4-4 and 4-5). McCuddy’s Marina is located in the city of Ridgefield, south of the Port of Ridgefield property on Lake River. The marina features approximately 60 moorage spaces for boats, boathouses, and houseboats, with open slips up to 40 feet long and covered slips up to 30 feet long (BST Associates, 2010). Felida’s Moorage is located on Lake River just north of Vancouver Lake and partially within Vancouver’s UGA. The marina features 41 houseboats. Kadow’s Marina is located near Caterpillar Island on the Columbia River within Vancouver’s UGA. The marina has 18 slips for floating homes and 100 slips for recreational moorage (BST Associates, 2010).

**Figure 4-4. McCuddy’s Marina and Felida Moorage**

![McCuddy’s Marina and Felida Moorage](source)

**Figure 4-5. Kadow's Marina**

![Kadow's Marina](source)
4.1.4 Parks and Recreation

The City of Vancouver and Clark County adopted a Comprehensive Parks, Recreation & Open Space Plan in 2007 (MIG, Inc., 2007). The plan identifies current and future recreation needs within the service area of the Vancouver-Clark Parks and Recreation Department (VCPRD). Chapter 4 of the adopted plan describes park, facility, and program needs. One of the noted needs is boating facilities and water access. The plan states the following:

“With the rising popularity of motorized and non-motorized boating, including canoeing and kayaking, there will be a need to create additional boat launch and water access points in Clark County. These access points should be distributed throughout the County along major waterways, including the Columbia River and its associated wetlands, as well as the East and North Forks of the Lewis River. Siting of access points should consider habitat and environmental quality, distances between points, river currents and channel patterns, available amenities, and the recommendations of the Regional Trail and Bikeways Systems Plan. Additionally, the Department could work towards developing a water trail along the Columbia River through continued partnership with the Lower Columbia River Estuary Partnership.”

BST also conducted an assessment of supply and demand for recreational boating facilities. According to their findings (Appendix E), the demand for boating facilities is projected to grow over the next 20 years as the population grows. The types of facilities needed by boaters include marinas, private docks, boat ramps, and transient (guest) moorage. Demand for marina moorage in Clark County is primarily generated by residents of Clark County, who account for an estimated 80 percent or more of total demand. The growth rate of recreational boating in Clark County is the major factor in the demand for marinas, boat ramps and other boating facilities.

Between 2000 and 2008, the number of recreational boats owned by residents of Clark County grew by more than 11,000. The number of boats grew at an average rate of 5.0 percent per year, compared with the population growth rate of 2.6 percent. This rate of increase is projected to slow substantially, but will still generate the need for additional boating facilities.

The existing supply of marina moorage in Clark County is approximately 650 slips, spread between four marinas: McCuddy’s Marina in Ridgefield, Kadow’s Marina between Vancouver and Ridgefield, Steamboat Landing Marina in east Vancouver, and the Port of Camas-Washougal Marina. The forecast suggests that there will be demand for an additional 410 wet moorage slips by 2030, or approximately two-thirds more than currently exists.

It is more difficult to forecast the demand for boat ramp space and transient moorage because usage data are generally not available. Use of most boat ramps and guest moorage is charged on an honor system basis and reliable records are not available. However, implications can be made about the overall need for space based upon general growth of the affected fleet.

There is very little transient moorage currently available in Clark County. The Port of Camas-Washougal Marina offers transient space in Camas, and there is a small amount available at Vancouver Landing, adjacent to the Red Lion Hotel. New facilities for annual and transient moorage are being considered at Ridgefield and at the Port of Camas-Washougal.
Operators report that boat ramps are used at or beyond capacity during selected peak days (i.e., nice weekend days in the summer or during fishing seasons). The forecast estimates that more than 1,000 additional trailerable boats will be purchased by Clark County residents over the next 20 years, necessitating additional boat ramps.

There is also strong growth forecast for hand-launched boats such as canoes and kayaks. Additional facilities for these boats are planned at regional park locations.

For additional details on other existing and planned recreational facilities, see the chapters on each city in Volume 2.

4.2 Potential Use Conflicts

Several development types and land uses present potential use conflicts within Clark County’s shorelines. These use conflicts are spread throughout the county.

4.2.1 Piers and Docks

Development of piers and docks has the potential for conflicts with other shoreline uses. Public piers and docks provide public access and recreation for shoreline users, a major policy objective of the SMA. Private docks associated with residential development are typically allowed, and are considered exempt from obtaining a shoreline permit under certain conditions (WAC 173-27-040(h)). Large concentrations of piers and docks can create conflicts with other uses by limiting potential for recreation and restoration and potentially interfering with navigation. Areas in which these conflicts may occur include the Columbia River and the house boat communities along Lake River.

4.2.2 Flood Management and Habitat Restoration

Conflicts may exist in Clark County along shorelines where structural flood control measures are utilized. While these measures protect structures and uses from flooding, they also result in a disconnection of the river from its floodplain which can have adverse impacts on hydrology and fish habitat. Structural flood control measures have been used in several SMA waterbodies including the East Fork Lewis River.

Conflicts also exist along shorelines which are regulated by various state and federal agencies with different mandates related to flood management and habitat restoration. For example, relocating levees further upland from the edges of rivers can address multiple flood management and habitat goals, such as creating shade and side channels. On the other hand maintaining existing levees can conflict with ecological protection/restoration. An example of this conflict is the U.S. Army Corps of Engineers requirements and guidelines for levee maintenance, which discourage tree growth on levees so as not to compromise the structures for flood certification.

4.2.3 Agricultural Uses

Conflicts may exist in Clark County between agricultural uses, other adjacent uses and environmental protection. Conflicts typically associated with agricultural uses include water quality degradation due to overproduction of nutrients to streams and lakes. Sources of nutrients are livestock waste and fertilizers. Conflicts also occur from livestock walking through stream
channels, which leads to slope failures and increased turbidity. In addition to conflicts with environmental conservation, agricultural uses have the potential to conflict with residential and commercial uses because of noise, odors and the hour of operations. Because agricultural uses generally do not create impervious areas, agriculture can provide an overall benefit in watershed processes, such as water retention and detention. Agriculture occurs throughout the central and western portions of the county. Greater concentrations around SMA waterbodies are found in the Lacamas Creek area and along the East Fork Lewis River, Salmon Creek and their tributaries.

According to the County’s Comprehensive Plan, roughly a quarter of the land located outside of UGAs is designated for agriculture. The Comprehensive Plan policy directs avoidance of use conflicts with an agricultural goal:

“To maintain and enhance productive agricultural lands and discourage incompatible uses associated with farming activities.”

The goal is implemented through policies that aim to avoid land use conflicts and include the following:

**Policy 3.4.5:** Land uses on commercial agricultural lands shall include all standard agricultural practices and supporting activities, including farm worker housing and use of water resources for irrigation.

**Policy 3.4.11:** Land use activities within or adjacent to agricultural land shall be located and designed to minimize conflicts with agricultural management and other activities on agricultural land.

**Policy 3.4.12:** Residential development on lands adjacent to agricultural land shall be located away from the agricultural land and shall provide a buffer between residential and agricultural activity.

**Policy 3.4.16:** Agricultural activities performed in accordance with county, state and federal laws should not be considered public nuisances nor be subject to legal action as public nuisances.

Agricultural uses along streams and lakes in Clark County are subject to the Habitat Conservation Ordinance (originally enacted in 1997 and amended in 2006) which incorporates habitat protections on agricultural lands. The ordinance requires landowners to develop a habitat protection plan consistent with a set of guidelines developed by the County.

### 4.2.4 Forest Practices

As in most jurisdictions, use conflicts exist in Clark County where forestry is the principal use. Forest resource lands cover much of the eastern portion of the county. Where land use is converted to non-forestry uses, the SMP would apply. Forestry activities in Washington are regulated by the Forest Practices Act (RCW 76.09) and implementing rules (WAC 222.08). Recently, mitigation measures have been incorporated to address forest practice impacts to watershed functions. The forest practices rules require a riparian management zone (RMZ) around all streams, where timber harvests are more closely regulated (WAC 222.30.020). The RMZ is composed of three concentric buffers, each with specific management rules. Timber harvest is only prohibited in the inner ring, which is generally 50 feet even though the SMA jurisdiction is a minimum of 200 feet.
However, within shorelines of statewide significance, the SMA allows only selective commercial timber cutting in which no more than 30 percent of the trees are removed in any 10-year period (RCW 90.50.150). Inherently, the Forest Practices Act and SMA could create potential conflicts between the demands of timber harvest and need for riparian habitat protection and stormwater control.

4.2.5 Mining and Gravel Extraction

Potential conflicts exist in between any resource extraction use and shoreline ecological preservation. Mining and gravel extraction uses are no exception. Gravel extraction is commonly associated with the shorelines of rivers, as they provide concentrated sources of gravel for urban and rural development. Mining and gravel operations can have adverse effects on habitat by causing erosion, increasing turbidity, and removing riparian vegetation. Gravel mining operations can also affect the hydrology and morphology of rivers by removing gravel from the floodplain and/or channel migration zone. In Clark County, gravel mining has been an issue along the East Fork Lewis River, with degradation of both habitat and stormwater control.

4.2.6 Utilities and Transportation Infrastructure

Installation of utilities in riparian buffers may be a potential use conflict in Clark County. Sanitary sewer utilities are typically designed to allow for gravity flow or require pumping facilities if there are topographic limitations. Such utilities tend to locate within shoreline areas either as outfalls discharging treated wastewater or as utility crossings. Pumping facilities, in some cases, also need to be located within shoreline areas. Establishing utility facilities is often in conflict with protecting riparian vegetation. Treated effluent may affect water quality and water quantity. Sanitary and storm sewer outfalls could result in streambank erosion.

Transportation facilities (roads and railways) have traditionally been placed within shorelines following topographically rational routes. However, the introduction of these fixed and impervious structures has resulted in greater stormwater runoff, more shoreline armoring and, in many cases, a separation of shorelines from their associated uplands. Placement of transportation structures in shorelines has resulted in adverse effects to shoreline functions such as habitat and channel migration. The continued use of these transportation corridors and placement of new roadways is often in conflict with protecting riparian vegetation and natural shoreline functions.

4.2.7 Permit Exemptions and Cumulative Impacts

A number of uses and activities are designated by the SMA as being exempt from the requirement to obtain a Shoreline Substantial Development Permit (WAC 173-27-040), but nonetheless have direct or cumulative adverse impacts to shoreline ecological functions. For example, single-family residential use is treated as a priority use under the SMA. Homes and bulkheads are exempt from permitting. Cumulatively, residential development in shorelines increases impervious surfaces and, if unmitigated, contributes to an overall decline in shoreline functions. The cumulative effects of bulkheads are also known to result in major impact to riverine habitat (WAC 173-26-231(3)(ii)). Similar issues are related to docks and piers. These activities are not exempt from the requirement to be reviewed for consistency with the SMP as part of other permit processes (e.g., county building permit; Hydraulic Project Approval, etc.).