

## 2.6 Natural Environment

Notable environmental attributes of West Anchorage include areas of mature forest, mature neighborhood landscapes, frequent wildlife spotting, the Anchorage Coastal Wildlife Refuge, and stocked lakes. Due to the presence of industrial activity in West Anchorage, there is potential for noise and reduced air and water quality. Turnagain neighborhoods located near the coast within the 1964 earthquake slide area have very high exposure to future seismic events. Bluff erosion, especially near Point Woronzof, threatens slope stability.

### 2.6.1 Water Resources

#### Surface Waters

West Anchorage is dotted with many small lakes and ponds that serve important community functions. Most lakes in the area provide valuable wildlife habitat and year-round recreational opportunities. Sand Lake, Jewel Lake, Westchester Lagoon, and Campbell Lake are the centerpieces of subdivisions, while Lake Hood/Spenard Lake is the principal floatplane base in Anchorage.

Lakes Hood and Spenard are classified as impaired<sup>8</sup> due to their low dissolved oxygen (DO) levels associated with urban runoff and general aviation activity. This is an improvement from previous years due to implementation of an Alaska Department of Environmental Conservation-approved waterbody recovery plan. Westchester Lagoon contains fecal coliform (FC) bacteria associated with urban runoff.

Chester Creek, Campbell Creek, and Fish Creek are also impaired waterbodies<sup>9</sup> with FC bacteria due to urban runoff. Fish Creek has its headwaters in Midtown and runs through culverts for long segments. Efforts are underway to restore it to a free-flowing waterway because channelized streams are less able to mitigate large runoff events and can result in erosion and degradation of fish habitat. Hood Creek and Chester Creek have been modified from their natural states to accommodate urban development. Campbell Creek remains the least impacted of all the waterways in the area due to lower density development and a greenbelt system at the southern end of the Bowl.

#### Groundwater Quality and Contaminants

Numerous properties in the southwest section of the West Anchorage District planning area are served by private drinking water wells that utilize groundwater (Exhibit 2-4). Some of these are traditional wells on parcels where public water has yet to be extended and/or are associated with older subdivisions whose plats were based on private well service.

*Some sections of West Anchorage have shown moderate nitrate levels in groundwater, but no private wells exceed EPA standards for drinking water. Recent studies of West Anchorage wells performed by the municipal Department of Health and Human Services (DHHS) have shown elevated arsenic levels, some of which may exceed EPA health guidelines. The current EPA limit for arsenic is 10 parts per billion. The Municipality has found that arsenic is a naturally occurring element in some Anchorage gravelly soils and bedrock; therefore, dissolved arsenic from weathered minerals can find its way into groundwater and surface waters. This process appears to be responsible for the elevated levels of arsenic found in groundwater that serves some wells in Anchorage. Private wells that have elevated arsenic levels are treated with simple filters, especially point-of-use filters at a kitchen tap or point-of-entry filters where water enters a home. A summary of the Municipality's findings and recommendations for arsenic in wells is on the DHHS web page.*

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<sup>8</sup> Category 5/Section 303(d) is a waterbody that is impaired for at least one designated use or one or more water quality standards are not attained. Listed in the ADEC, 2010 "Integrated Water Quality Monitoring and Assessment Report"

<sup>9</sup> Category 4a is an impaired waterbody that was previously listed in Category 5 but for which a total maximum daily load has been completed and approved by EPA (ADEC, 2010).

## **Anchorage Coastal Zone**

The Anchorage Coastal Zone/Designated Recreation Areas include coastal floodplains and the upstream floodplains of creeks draining into coastal waters (Exhibit 2-14). The Anchorage Coastal Zone was established to ensure the preservation of coastal habitat and the maintenance of recreational use and public access to coastal areas, both seen as critical to the quality of life in the Municipality of Anchorage. Any activities with potential to impact the Anchorage Coastal Zone or the underlying physical, biological and cultural resources of a Recreation Use Area are required to undergo a review process. In West Anchorage, the MOA has designated Kincaid Park, the Tony Knowles Coastal Trail, and the Chester Creek Trail as Recreation Use Areas within the coastal zone, while a strip of land bordering Cook Inlet and the Fish Creek Estuary and Westchester Lagoon are inside the Anchorage Coastal Zone Boundary.<sup>10</sup>

## **Water Pollutants**

Lakes and waterways in West Anchorage experience impacts related to their location in an urban environment, primarily from runoff. Storm water runoff collects contaminants from roads, lawns, and paved surfaces on its path to the waterways. These can include fuel spills, oils, and grease associated from vehicle operations.

Low levels of dissolved oxygen are typical in northern bog lakes such as those found in West Anchorage because bog lakes are shallow with high organic content that consume oxygen. West Anchorage lakes that permit float planes experience direct contamination from aviation-related fuels and grease.

The MOA is covered by a National Pollutant Discharge Elimination System (NPDES) water quality permit, which is managed and monitored by the MOA Watershed Management Section of the Project Management and Engineering Division of Public Works.

Lake Hood and Lake Spenard were listed by ADEC as "impaired" because of impacts by limited inflow, high fecal coliform, lead, nitrates, phosphates, and low dissolved oxygen. Extensive aviation operations and urban runoff add contaminants to Lake Hood and Lake Spenard including fuel, oils and grease, and deicing agents (urea, potassium acetate, propylene, and ethylene glycols). Glycol recovery operations have improved water quality in Lakes Hood and Spenard. An active vegetation harvesting program alleviates deicing chemical impacts to the lakes consistent with the Airport's Waterbody Recovery.

## **Wetlands**

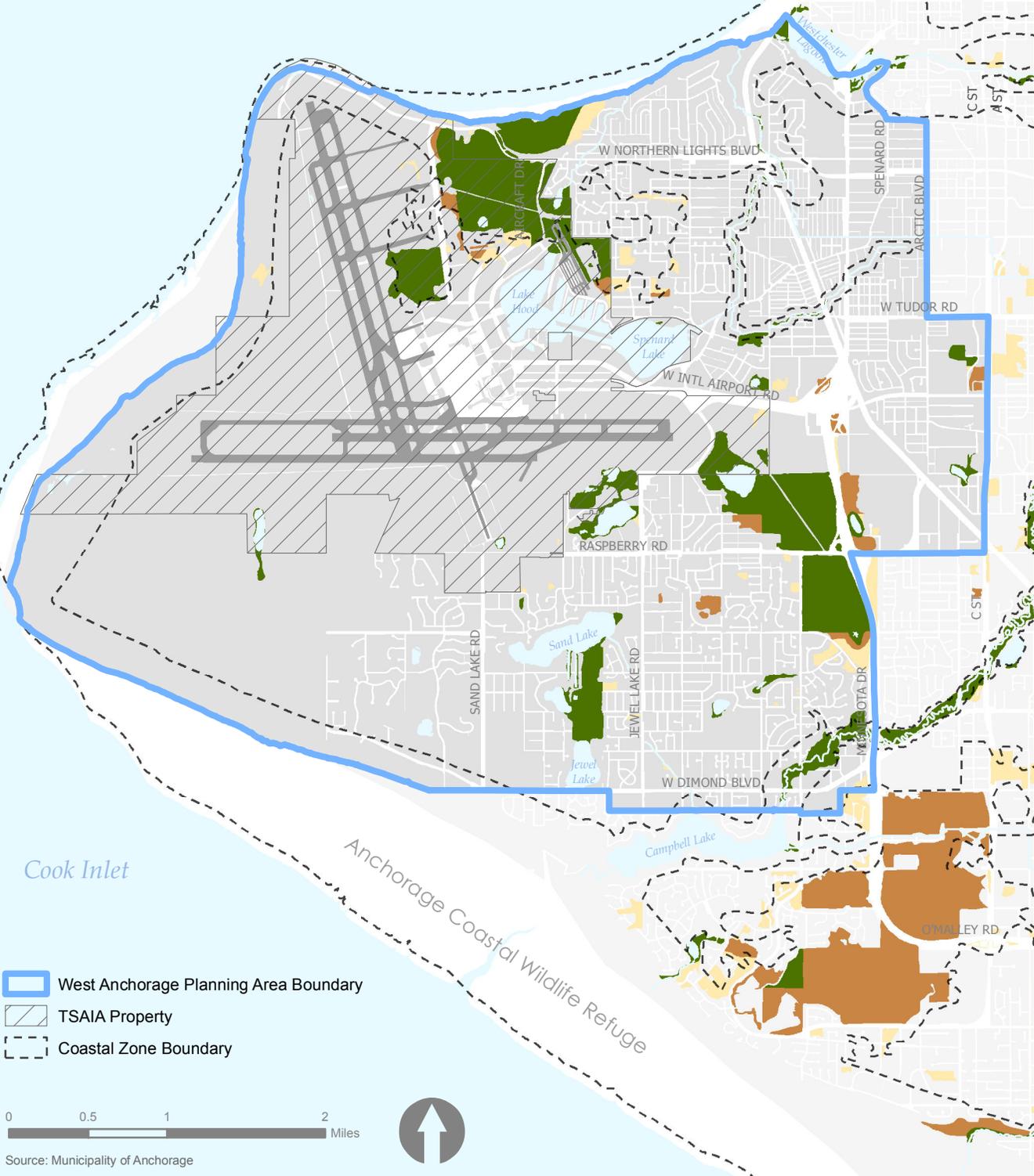
Both freshwater and saltwater wetlands are found in West Anchorage. Saltwater wetlands are located in intertidal areas at the high tide line. Freshwater wetlands are scattered throughout the area and consist mostly of peat bogs. The *Anchorage Wetlands Management Plan* (1996) assigns formal designations for the fresh water wetlands within the planning area. These designations reflect varying ecological function and social values of wetlands. Class A wetlands are considered the highest value. If they cannot be avoided during development, they require substantial compensatory mitigation to minimize impacts to their functions and values. Class B and C wetlands are of less value but still require mitigation before development can be considered (Exhibit 2-14). Historically, a large proportion of the original wetland acreage in the planning area has been filled for development. Larger bogs and patterned ground wetlands still exist in West Anchorage in the TSAIA complex, Connors Bog, and the Sand Lake-Jewel Lake complex. Many of these wetlands are in public ownership, with others located on TSAIA.

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<sup>10</sup> The State of Alaska's Coastal Management Program sunset on June 30, 2011, which means that the local *Anchorage Coastal Management Plan* no longer has standing in state matters. Since Anchorage's plan is an element of the Comprehensive Plan, its policies still apply to activities within the municipal coastal boundary.

**Wetland Classification**

- Class A (High Value)
- Class B (Moderate Value)
- Class C (Low Value)



## 2.6.2 Air Quality

The community continues to express concern regarding odors in Kincaid Park, in Point Woronzof Park, along the Tony Knowles Coastal Trail, and in neighborhoods adjacent to the airport. Air emissions associated with jet fuel include inorganic gases like carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO, NO<sub>2</sub>NO<sub>x</sub>), and Volatile Organic Compounds like benzene, oxygenated organics, which include compounds such as formaldehyde, acetaldehyde and aromatic hydrocarbons. In 2002, the DHHS studied ambient air in the winter in order to characterize concentrations for specific volatile organic compounds (VOCs) or generally, air toxics that can cause odors that the public reports. Airport activities did not cause unacceptable levels of carbon monoxide (CO) or VOCs.

The Municipality has been successful meeting air quality standards for CO and continues to monitor pollutant levels. The primary sources of CO in the Bowl are automobile traffic, airport operations, and wood burning (Table 2.6-1). CO levels vary throughout the year and are highest in the winter months due to cold starts and long morning idle times. Strong temperature inversions further compound the problem by trapping CO close to the ground. Exposure to odors in the airport area continues to be an issue in surrounding recreation and neighborhood areas.

Table 2.6-1 CO Emissions in the Anchorage Bowl, Typical Winter Weekday, 2007		
Source Category	CO Emitted (tons/day)	Percent of Total
Motor vehicle – on-road travel	50.9	50.5% <sup>a</sup>
Motor vehicle – warm-up idle	16.1	16.0% <sup>a</sup>
Ted Stevens Anchorage International Airport Operations	12.4	12.3%
Merrill Field Airport Operations	0.7	0.7%
Wood burning – fireplaces and wood stoves	6.2	6.2%
Space heating – natural gas	3.8	9.2%
Miscellaneous (railroad, marine, snowmobiles, snow removal, portable electrical generators, welding)	9.3	9.2%
Point sources (power generation, sewage sludge incineration)	1.3	1.3%
<b>TOTAL</b>	<b>100.7</b>	<b>100.0%</b>
Source: MOA Department of Health and Human Services (DHHS), 2009. "Air Quality in Anchorage: A Summary of Air Quality Monitoring Data and Trends 1980-2008." <sup>a</sup> A 2006 DHHS study found 77% of winter CO emissions in the MOA come from motor vehicles.		

### **2.6.3 Natural Hazards**

Natural hazards known to affect the planning area include earthquakes, wildfires, flooding, severe winter storms, and volcanic eruptions; the risk to development from seismic activity is the most unique to West Anchorage.

Small earthquakes occur frequently in Anchorage. There have been 12 events with a magnitude greater than 4.0, with an epicenter within the MOA boundary since 1900. Of these, only the Good Friday earthquake of 1964 caused any lasting damage, with large sections of the bluff near Earthquake Park sliding into Cook Inlet.

In West Anchorage, the MOA seismic hazard maps identify an area of “very high ground failure susceptibility risk” concentrated around Earthquake Park. This area roughly coincides with the Bootlegger Cove clay formation, while additional areas of “high risk” can be found along the coast, Westchester Lagoon, portions of Chester Creek, and Campbell Lake.

### **2.6.4 Fish and Wildlife**

West Anchorage has an abundance of wildlife, largely resulting from the Municipality's extensive network of open space and greenways that provide effective wildlife habitat. These corridors allow travel from the Chugach State Park throughout the Bowl. High-value urban wildlife habitat in West Anchorage includes the Chester Creek Trail corridor, the Tony Knowles Coastal Trail corridor, Kincaid Park, the Anchorage Coastal Wildlife Refuge and adjacent forested bluff, Earthquake Park, the Fish Creek Estuary, and large tracts of undeveloped land surrounding the airport, including intertidal fringes.

Wetlands throughout the area provide important feeding and nesting habitat for sensitive migratory species, such as snow geese and sandhill cranes. The wood frog is the only native amphibian species present. Beluga whales are periodically observed along the coast, traveling in and out of upper Cook Inlet. These whales were listed as a “species of concern” in 1988 and then listed as an Endangered Species in 2008. The National Marine Fisheries Service designated critical habitat essential for beluga whale conservation in sections of Turnagain and Knik Arms in April 2011.

Anadromous streams in the planning area include Fish Creek, Chester Creek, and Campbell Creek, which have varying returns of all five salmon species. Recent habitat improvements have been undertaken at Westchester Lagoon to restore salmon runs to Chester Creek. DeLong and Jewel Lakes are stocked with rainbow trout for sport fishing annually. Invasive northern pike are present in many of the planning area's lakes, with Alaska Department of Fish and Game (ADF&G) efforts to eradicate them achieving only moderate success. Other fish commonly found in area lakes include grayling, arctic char, and stickleback.

For a complete listing of fish and wildlife found within the Municipality, including bird areas and nearshore areas valuable to juvenile and adult salmon and beluga whales, refer to the 2000 plan *Living with Wildlife in Anchorage: A Cooperative Planning Effort* and the 2007 *Anchorage Coastal Management Plan* resource maps. *Anchorage 2020* provides a map indicating important wildlife habitats and community preferences for natural open spaces.