

DRAFT
Natural Resources, Hazards, and Habitat Chapter

Auke Bay Area Plan

Natural Resources and Habitat

The 2013 *Comprehensive Plan* addresses Natural Resources and Hazards in Chapter 7. Excerpts from that chapter are included in the *Comprehensive Plan* Appendix to this plan. This chapter includes many policies, development guidelines, and implementing actions that relate to the Auke Bay Plan Area. These policies include, in part: preservation of habitat and scenic corridors; protection of stream corridors and lake shorelines; protection of high-value wetlands; and protection of biodiversity, which includes invasive species eradication. These policies are adopted into the Auke Bay Area Plan by reference.

The introduction to the Coastal Resources Planning section of the Comprehensive Plan refers to Auke Bay as an “environmentally-sensitive habitat and waterfront area...particularly subject to intense development pressures...” This chapter is intended to address these issues.

Existing Conditions

Habitat

Anadromous (salmon-bearing) habitat exists throughout the Auke Bay area. The Alaska Department of Fish and Game notes four streams flowing into Auke Bay that have been officially catalogued as anadromous waters. Six additional cataloged streams supporting anadromous fish flow into Auke Lake, itself a cataloged lake. All of these waterbodies are also protected by 50-foot no development habitat setbacks in the CBJ Land Use Code, section 49.70.310, and are designated as SC, Stream Corridor in the Comprehensive Plan.

Even with habitat setbacks, water quality in the streams flowing into Auke Bay and within the bay itself, can be negatively impacted by non-point and point source pollution in the various watersheds which drain into Auke Bay. In addition to potential impacts of runoff, marine habitat has been directly impacted by development. Critical habitat for keystone species such as eelgrass beds for herring has been destroyed both in Auk Nu Cove and in Auke Bay by intertidal fill. Due to habitat loss and other factors, the historic herring spawning that has occurred in the Auke Bay area has moved northward towards Bridget Cove and Berners Bay; however, the 2014 aerial surveys of herring spawning conducted by ADF&G documented herring schools and spawning in both Auke Bay and Auk Nu Cove.¹ If remaining habitat is protected and water quality preserved, the population of this important species could rebound in the Auke Bay area.

¹ Juneau Herring Update #10, Alaska Department of Fish & Game, May 8, 2014

Although the possibility for a herring population rebound exists in this area, it will take a concerted effort to enable this stock to recover to levels where they can be commercially harvested. The Lynn Canal herring fishery been closed since 1982², and the estimated biomass of the fishery has only exceeded the threshold for opening the commercial fishery twice since 1979, most recently in 2013, when 8,000 tons of spawning biomass was estimated. With a threshold of 5,000 tons of spawning biomass for opening the fishery, and a history of very low biomass (as low as 231 tons in 2005), ADF&G will not open the fishery in 2014. If this population were to rebound to commercially harvestable levels, an important and lucrative component of the commercial fisheries industry would be renewed in the Juneau area.

In addition to anadromous fish and keystone species such as herring, the Auke Bay area is home to a multitude of other species, with over 50 documented Bald Eagle nests; moderate- to high-value summer bear habitat; and a full range of suitable winter habitat for deer, such as high-value habitat along the west side of the Mendenhall Peninsula and Pederson Hill, and along the flanks of Auke Mountain.³

Reports and Studies

The last soil study for the Borough, including the Auke Bay area, was completed in 1974 by the U.S. Department of Agriculture (USDA). A full copy of this study is not available. USDA has been conducting new soil surveys in the borough and expects to release the results of a new study in early 2015.

The Juneau Watershed Partnership, a local non-profit organization, published the Auke Lake Watershed Action Plan in December 2009. This document provides an overview of the watershed resources in Auke Lake, potential threats such as pollution, habitat loss and degradation, and erosion and sedimentation. Recommended actions to address these threats include, in part, the following: 1) a long-term water quality monitoring plan; 2) resource inventory and mapping; 3) improved stormwater management; 4) advocacy for low-impact development to maintain natural hydrology; 5) establishment of conservation areas in important habitat areas; and 6) habitat restoration in degraded areas.

The 2008 Juneau Wetlands Management Plan (JWMP) provides minimal and outdated wetland information for the Auke Bay Area. The 2008 plan is based on wetland studies completed in the 1980s and includes the same wetland boundaries and assessments as the original JWMP that was adopted in 1992. The CBJ Community Development Department is in the process of updating the JWMP with funding from a federal grant. The new JWMP will provide updated wetland boundaries and wetland assessments for selected vacant public parcels in the Auke Bay area that are likely be developed in the next 10-20 years. The plan will also include wetland assessment information for vacant

² 2014 Southeast Alaska Sac Roe Herring Fishery Management Plan, Regional Information Report 1J14-02, ADF&G

³ WESPAK-SE, Southeast Alaska GIS Library, seakgis.alaska.edu/flex/wetlands

private parcels, where permission from private landowners may be obtained. A draft updated JWMP is expected in 2016.

Vision

The Auke Bay Area Plan's Vision Statement refers to Auke Bay as a gateway to outdoor activities. Although some of these activities could occur without healthy ecosystems and within fragmented habitat, much of the adventure and sense of wonder that Juneau residents experience while hiking or boating comes from their immersion in the untrammelled nature that surrounds us.

Protecting habitat corridors, critical habitat, and other aspects of the environment, from the icefield to the ocean, will result in healthier fish and wildlife populations and easier access to natural areas for future generations of Juneauites, while respecting and supporting the subsistence traditions of the Aak'w Kwáan and other Tlingit peoples.

In accordance with this vision, the Auke Bay Area Plan adopts the following policies:

Natural Resources and Habitat Goals & Policies

Water

Goal 1: Maintain healthy water quality in Auke Bay and Auke Lake as the area develops.

Policies

- 1.1 Assess capacity and operation at the Auke Bay Wastewater Treatment Plant to ensure that the plant can meet future demands.
- 1.2 Utilizing the *CBJ Manual of Stormwater Best Management Practices* **and other resources, develop specific urban development stormwater treatment strategies to ensure long term, effective stormwater treatment in commercial, residential and harbor areas.**
- 1.3 Identify key sources and locations of non-point pollution and develop solutions.
- 1.4 Identify sewer marine outfalls and priority areas for CBJ sewer extension.
- ~~1.5~~ ~~Preserve a minimum 50-foot no-development setback along anadromous streams and Auke Lake.~~
- ~~1.6~~ 1.5 Develop a water quality education pamphlet and signage for Statter Harbor users.

Goal 2: Protect and restore marine habitat in Auke Bay.

Policies

- 2.1 Evaluate habitat enhancement options, such as placement of herring spawning substrate, on harbor infrastructure and other structures within the *Auke Bay Area Plan* area.

- 2.2 Develop a map of eelgrass beds and create a plan to reduce sedimentation and other impacts in these areas.
- 2.3 Pursue grant funding to research other habitat enhancement options.

Land

Goal 3: Preserve natural areas along the shoreline and in publicly-owned uplands.

Policies

- 3.1 Develop tools for transferring density or development potential from high value wetlands and large forested tracts to other areas within the watershed or planning area.
- 3.2 Identify high-value wetland areas and streams for protection through conservation easements or as natural area park designations.
- ~~3.3 Identify degraded areas that would benefit from enhancement or restoration methods.~~
- ~~3.4 Map potential wildlife corridors through residential and commercial areas throughout the Plan area.~~
- ~~3.5~~3.3 Develop the seawalk with consideration for protecting and preserving natural functions and characteristics of the shoreline where appropriate and feasible.

Goal 4: Preserve native vegetation.

Policies

- 4.1 Conduct an invasive species inventory.
- 4.2 Develop an eradication and prevention plan.
- 4.3 Seek funding and volunteer support to implement an eradication and prevention plan.

Land and Water

Goal 5: Encourage development of a stewardship plan by locally-based volunteer groups.~~Develop an Auke Bay Stewardship Plan.~~

Policies

- 5.1 Encourage implementation of the Auke Bay Area Plan.~~Conduct a habitat inventory to identify critical areas.~~
- ~~5.2 Develop specific maintenance and improvement plans.~~
- ~~5.3 Establish a committee and community volunteers to champion and implement maintenance and improvement plans.~~

NATURAL HAZARDS

Due to the location, climate, and steep mountainous landscape, the City & Borough of Juneau can be affected by many natural hazards. The CBJ has adopted several natural hazard studies and regulations to help educate the public, map areas that are susceptible

to natural hazards, and ensure safe development. Though there are many natural hazards that can affect the borough, the following three are most important to Auke Bay: 1) Floods, 2) Earthquakes, and 3) Landslides.

FLOODING

Existing Conditions

Development in the Auke Bay area has largely occurred along the shorelines where flat ground is most prevalent and where maritime lifestyle was central to past settlements. Steep mountains and hillsides above the shorelines have pushed development close toward the water. The bay is relatively protected from large coastal waves and tsunamis due to the outlying islands, such as Spuhn Island, Portland Island, and Coghlan Island, as well as the meandering shorelines outlining the bay itself. Nonetheless, shoreline development may still be susceptible to flooding damage. The locally famous 1984 Thanksgiving Day Storm produced intense wind and waves throughout borough and neighboring Southeast Alaskan communities. Auke Bay experienced rolling waves and some boat owners untied their boats to free them from being thrashed against the mooring floats.

To protect and educate the public and developing in the Auke Bay area, CBJ utilizes the 2013 *Flood Insurance Rate Map (FIRM)*. The FIRM depict areas or ‘Special Flood Hazards Areas’ that would be inundated by a 100-year storm event which would have the potential of producing +3-foot high waves and a wave run up of two feet at the shorelines. Future development in these areas is required to meet strict flood regulations.

Auke Bay commerce and lifestyle was and continues to have a critical connection to the water. Many marine uses exist and must be designed and renovated to withstand flooding forces so Auke Bay may continue its unique marine tradition.

Vision

Be aware of area susceptible to flooding and developing uphill from the mapped flood hazard can preserve the livelihood and economy of Auke Bay. Marine uses such as seafood processing facilities, harbors, etc. which may be located in harms way will need to be further reinforced to withstand flooding forces.

Goals & Policies

Goal 6: Reduce hazards from flooding through effective floodplain management consisting of public education and awareness, reinforcing public infrastructure, and ensuring flood studies/ maps of Auke Bay, local streams, and Auke Lake are up to date.

Policies

- 6.1** Encourage development to occur away from mapped high risk flood zones.
- 6.2** When located in a mapped high risk flood zone, encourage CBJ and non-CBJ infrastructure to be re-built to exceed 100-year storm flood forces.

- 6.3 Coordinate with the Alaska DOT/ PF on flood map changes that may affect the Alaska Marine Highway Auke Bay ferry terminal.
- 6.4 Pursue new flood studies and map revision of Auke Bay and nearby waterbodies for updated flood risk mapping and awareness, when necessary.
- 6.5 Educate property owners of the flood risk through public meetings, presentations, mailings, signage, etc.
- 6.6 Encourage CBJ Docks & Harbors to post and/or distribute a storm emergency plan for harbor users.
- 6.7 To increase flood protection and lower flood insurance costs, encourage new buildings that are in mapped high-risk flood zones to have their lowest floor to be designed at least two feet above the base flood elevation.

EARTHQUAKES

Existing Conditions

Eleven percent of all earthquakes in the world occur in Alaska, and 15% of all earthquakes in Alaska occur in Southeast Alaska⁴. There are two seismic faults where earthquakes may occur that can affect Juneau residents: 1) Queen Charlotte-Fairweather fault (just west of Sitka), and 2) Chatham Strait fault (along Favorite Channel and Lynn Canal). Both are slip-strike faults which tend to result in low tsunami occurrences, as compared to a Thrust fault or subduction earthquake. The Queen Charlotte-Fairweather fault has caused more earthquakes felt by Juneau residents than the Chatham Strait, despite the latter being within the borough⁵. There is little recorded seismic history of the Chatham Strait fault, but is still of concern. One of the most recent and notable earthquakes affecting Juneau residents was a 5.9 magnitude occurring on July 25, 2014⁶. This earthquake disconnected a crucial buried fiber line carrying personal and commercial communication from the Lower 48 to Juneau for a 24-hour period⁷. Earthquakes having a 6.0 magnitude or larger on the Richter scale are considered a ‘strong event’⁸. Based on studies by the U.S. Army Corps of Engineers and United States Geological Survey, the CBJ Building Code places Juneau in a Seismic Design Category D1, in which major damage to structures from an earthquake equal to or greater than 6.0 on the Richter scale may occur (previously known as a Seismic Zone 3)⁹.

Add Liquefaction

⁴ Page 71, The City & Borough of Juneau All-Hazards Mitigation Plan, August 12, 2012

⁵ Haeussler, Peter J. and Plafker, George, ‘Historic Earthquakes, Active Faults, and Rupture Zones’, Alaska Earthquake Information Center, Geophysical Institute, University of Alaska Fairbanks, http://www.aeic.alaska.edu/html_docs/historic_quakes_tectonics.html

⁶ Earthquake Track, USGS, <http://earthquaketrack.com/us-ak-juneau/recent>

⁷ “Update: Communications restored following earthquake caused disruption”, KTOO News Dept., <http://www.ktoo.org/2014/07/25/earthquake-felt-southeast-alaska-tsunami-expected/>

⁸ Page 70, The City & Borough of Juneau All-Hazards Mitigation Plan, August 12, 2012

⁹ Page 98, 2013 The City & Borough of Juneau 2013 Comprehensive Plan

Vision

Earthquakes from the Chatham Strait and Queen Charlotte-Fairweather faults can affected the Auke Bay area. Extra care should be taken when building new structures or rehabilitating existing ones. Understanding the composition of the ground material and how building's foundations connect to it, can help improve how buildings withstand seismic activity. Designing infrastructure in the Auke Bay to withstand high seismic activity will help preserve the way of life in the area.

Goals and Policies

Goal 9: Reduce hazards from earthquakes through public education, reinforcing public infrastructure, and hazard mitigation.

Policies

- 9.1** Retrofit old buildings that do not have earthquake resistant material and/or designs, when appropriate.
- 9.2** Retrofit existing CBJ buildings and utilities with earthquake resistant material and/or designs, especially community emergency shelters, when appropriate.
- 9.3** Be proactive in earthquake hazard planning through surveying and mapping soils having high risk of liquefaction.
- 9.4** Provide earthquake awareness meetings, web-based programs, etc. for greater public education.

LANDSLIDE/ AVALANCHE HAZARDS

Existing Conditions

Development in the borough has largely occurred along narrow flat land between the bottom of steep mountains on one side and the ocean's shoreline on the opposite. Thus, development has created linear sections. In certain areas these two elements can be lead to unsafe conditions during the winter or wind storms. Linear development is very apparent in Auke Bay. Unlike downtown Juneau and the Mendenhall Valley where the mountains are very steep and landslides and avalanches are common, the mountains defining the Auke Bay area are gradual and offer benches which could be suitable for future development. Nonetheless, unstable soils and large clearing of trees and vegetation can increase the potential for landslides and avalanches.

To understand where development may be in harm's way of landslide/ avalanches hazards, the CBJ has adopted studies and maps to inform the community of these areas adopted specific building and zoning regulations to ensure safe building practices. Although there are no mapped landslide/ avalanche hazards in Auke Bay, the community and developers should take special care when developing or clearing vegetation on or near hillsides.

Goals and Policies

Goal 10: Reduce hazards from avalanches/ landslides through public education and hazard mitigation.

Policies

- 10.1 Study and map areas of Auke Bay that may be susceptible to avalanches or landslides.
- 10.2 Prevent or mitigate clearing of vegetation along and near steep hillsides to reduce increased landslide susceptibility.
- 10.3 Discourage development in areas of high avalanche/ landslide risk.
- 10.4 Install signage in public places of mapped avalanche/landslides for greater public education and awareness of risks in the area.
- 10.5 Reinforce CBJ infrastructure in mapped avalanche/ landslide areas.