

**Appendix Q. Preliminary Analysis of the Environmental Affected by
the Engineering Preferred Alternative**

Auke Bay Corridor. Analysis of the Environment Affected by the Preliminary Preferred Alternative

Right of Way

The long term phase 1 route from Glacier Highway to Back Loop Road would require acquisition of approximately 2.5 miles of right of way. The City and Borough of Juneau owns the majority of property along this route. The long term phase 2 would require acquisition of an additional 2.5 miles of right of way. This route would involve private, University of Alaska, City and Borough of Juneau and State Mental Health properties. The majority of land which would be included in right of way for the Auke Bay Bypass is currently undeveloped and held by government entities. Private property would be involved where the new road intersects Glacier Highway and the Back Loop Road.

It is estimated that the construction of the preliminary preferred alternative would result in the removal of five house and two garages. This alternative is characterized by three substantial changes in access grade and would require the relocation of 13 power poles and the removal of 13 parking spaces.

Social

Social impacts include adverse impacts to traffic patterns and accessibility, affects to school districts, recreational areas, churches, businesses and emergency services, and affects to special interest groups, minorities and economically disadvantaged.

The University of Alaska Southeast (UAS) and Auke Bay Elementary School are both located along the project corridor. Parking for the Spaulding Meadows trail is located just off Glacier Highway. Boating, bicycling, hiking and kayaking are popular recreational activities in Auke Bay. Chapel by the Lake and Auke Bay Bible Church are also located along the project corridor.

The roundabouts included in the preliminary preferred alternative would provide improved safety and access through and within the immediate Auke Bay area. Local drivers, bicyclists and pedestrians would need to learn how to navigate roundabouts. Minimal changes in traffic patterns within the immediate Auke Bay area would be expected.

The Auke Bay Bypass would provide an alternate route for drivers wishing to avoid the commercial Auke Bay area and would provide several miles of additional roadside for bicyclists. The long-term phase 2 –seawalk, when connected to sidewalks, that are part of the short term improvements would provide a new and safe access for pedestrians from the ferry terminal through the Auke Bay area.

The proposed Auke Bay Bypass would access City and Borough of Juneau lands which are zoned for residential development. This area could provide up to 350 new lots.

Economic

Auke Bay supports a variety of public, private, commercial and institutional developments. Fisherman's Bend Marina is built on state leased and private tidelands and has boat stalls, a boatlift, fuel dock, marine repair shop, and both covered and uncovered dry boat storage. Fishermen's Bend also includes an office, boating/fishing supply/convenience/liquor store and auto gas pumps on private uplands. DeHart's Marina is on state leased and private tidelands some of which are filled. The marina includes boat stalls, a boatlift, fuel dock, dry storage, and repair yard. On private uplands there is a small/grocery/convenience/liquor store and auto gas pumps. On the uplands side of Glacier Highway there is a building that houses a bar and restaurant, another restaurant, a hair salon and residential apartments. An office building is located just west of the Glacier Highway-Back Loop intersection.

Proposed short-term improvements will provide a safer and more logical flow of traffic through and within the immediate Auke Bay area. The proposed roundabout at the Glacier Highway-Back Loop Road intersection would address safety and sight distance concerns. However the roundabout would eliminate direct access from Glacier Highway to DeHart's. The store's access to Harbor Way would remain.

Residential development in areas accessed by the Auke Bay Bypass would provide economic opportunity for local businesses and would add to the local tax base. The Bypass may negatively impact businesses in the Auke Bay area as it will provide an alternate route and could decrease traffic traveling past businesses and stopping to make spur of the moment purchases.

Local Land Use and Transportation Plans

According to the December 1993 **Department of Natural Resources, Juneau State Land Plan**, Auke Lake will be managed to support the high public values of the lake including research, water quality, habitat restoration, fisheries management, summer and winter recreation, and landings by aircraft.

According to the July 1996, **City and Borough of Juneau, Juneau Parks and Recreation Comprehensive Plan**, a master plan should be developed for the area around Auke Lake. This report also recommends a trail corridor between UAS student housing and Auke Bay School to be considered for bicycle and skiing use. Furthermore, the report recommends the reservation of a trail corridor between the Auke Bay Elementary School and the Spaulding Meadows trail so Auke Bay school parking lot could provide the necessary overflow parking for the trailhead.

According to the **CBJ Area wide Transportation Plan of July, 2001** the forecast transportation deficiencies relating to Auke Bay are that the Glacier Highway is the only arterial through the area as well as the "main street" of the sub-area. Within a relatively congested area, there is a significant difference in travel speeds between motorized vehicles making local or through trips and pedestrians and bicyclists traveling along or across the highway. This area must be designed to adequately serve pedestrians, bicyclists, and local vehicle trips and through vehicle trips.

Further, the plan suggests that improvements for Auke Bay could be traffic calming and the construction of a roundabout or traffic signal at the Back Loop Road intersection. This would integrate the intersection with main street/traffic calming treatments through Auke Bay. Traffic calming treatments used may include landscaping, sidewalks on both sides of the street, access management, pedestrian level lighting, bus pullout/shelter, curb extensions and bicycle lanes. A roundabout could serve as a gateway treatment and a traffic-calming device in the school area. The plan also suggests including pedestrian crossing amenities between University of Alaska campus facilities that are separated by the highway.

The **CBJ 1995 Update to Comprehensive Plan** suggests undertaking transportation improvements within Auke Bay to accommodate additional demand resulting from the construction of the ferry terminal, boat marina, and other facilities, as well as the expansion of the University of Alaska. The plan suggests that the proposed corridor should follow the division between low and medium density residential uses where possible.

The plan also suggests evaluating a corridor realignment of Glacier Highway from its intersection with UAS to Auke Bay and encouraging a new driveway for UAS that avoids the Auke Lake Wayside and minimizes adverse traffic impacts.

Finally the plan suggest requiring sidewalks and bicycle paths or lanes along existing or newly constructed arterial and collector streets, where appropriate, to provide safe and efficient access and recreation and to reduce pedestrian/automobile conflicts.

The **UAS Final Draft Executive Summary Campus Facilities Master Plan, February 2002** presents three site concept options. Option 1 would establish the north entrance off Back Loop Road as the only public entrance to the core area of the campus. The existing entrance from Glacier Highway would be used for access to the Church property and emergency/service access for the campus. Options 2 and 2B would develop a new primary entrance off of Glacier Highway to the south of the existing entrance. A bridge would be required over Auke Creek. Option 3 would realign the existing primary entry drive of Glacier Highway and relocates this road within the campus.

According to **Steve Gilbertson, CBJ Lands and Resources Manager**, there is a proposed subdivision in the Pederson Hill area. The proposal calls for the development of 350 lots. There are also an additional 330 lots on the Mendenhall Peninsula that could be developed.

The preliminary preferred alternative is consistent with the plans discussed above. It may also facilitate the opening of CBJ lands in the Pederson Hill for development.

Cultural Resources

Charles M. Mobley and Associates conducted a cultural resource investigation for NMFS in 1996. In his report he investigated the area near Auke Cape (outside of our study limits), the existing NMFS facility, and an undeveloped parcel southeast of the Fritz Cove Road's intersection with the Glacier Highway, about one-half mile east of the present laboratory.

At the existing NMFS facility site he documented two cannery sites and a midden that he felt would be eligible for the National Register. The two canneries were the Auke Bay Salmon Canning Company and the John L. Carlson Canning Company. The canneries were owned and operated by John L. Carlson and his three sons between the years 1916 and 1923. The historic midden from the John L. Carlson cannery is located on the bluff on the UAS lot immediately adjacent to Auke Creek.

At the parcel southeast of the Fritz Cove Road and Glacier Highway intersection he documented eleven culturally modified trees and the Winn Prospect. The Winn prospect was a deposit located in 1882 at the same time gold was discovered in Montana Basin. John Winn and his father Col. William Winn restaked it in 1909. The father-son team employed ten men for an un-recorded length of time. The rock forming the north end of Pederson Hill is mineralized with other ores besides gold, according to local residents and state assays, but a commercial deposit has not been identified. According to Mobley, the Winn Prospect is not likely to be eligible for inclusion of the National Register.

The photograph below was taken by the USFS about 1920. The red arrows point to the Auke Bay cannery on the left John L. Carlson cannery on the right. The green arrow points to the approximate location of the Winn Prospect.

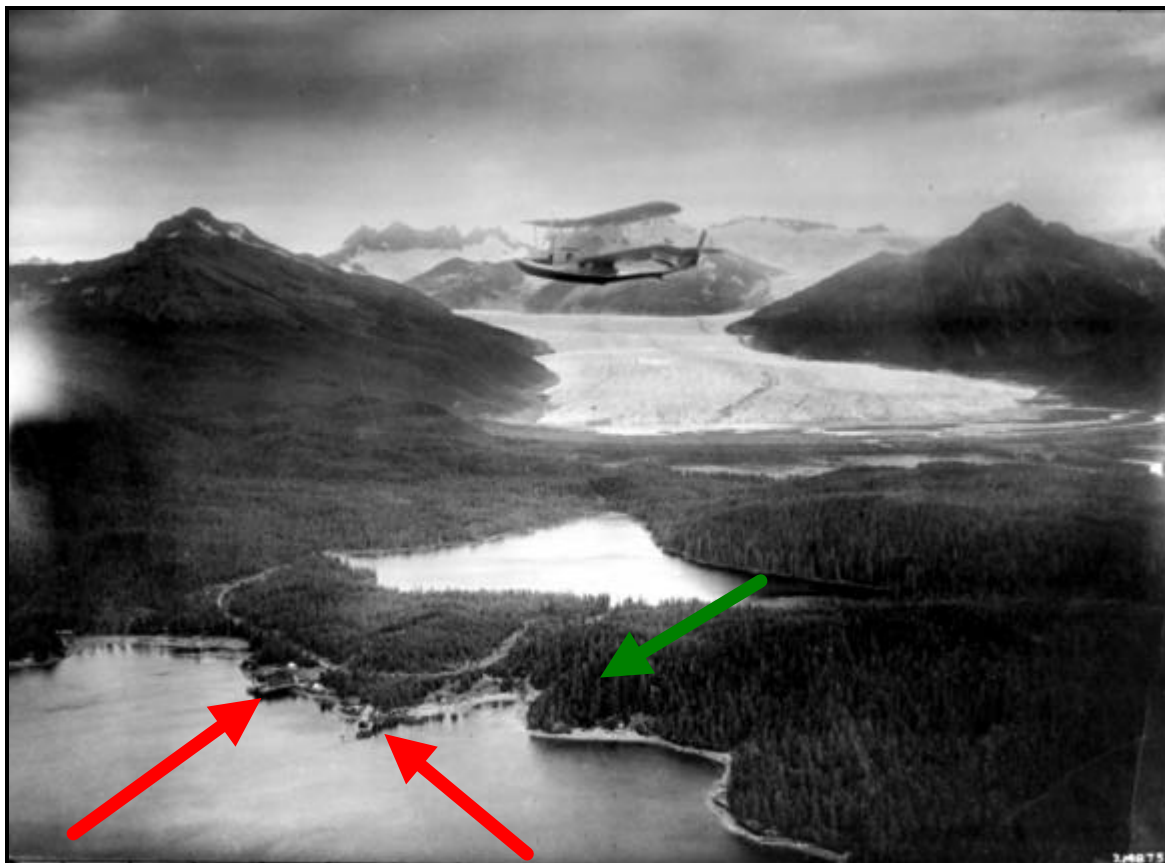


Figure 1 - PCA 207-36-17, Alaska State Library USFS collection

The preliminary preferred alternative would not impact any known historic, archaeological or culturally significant resources.

Wetlands

The Juneau Wetlands Management Plan was updated in May 1994. A map from the plan has been reproduced and follows this paragraph. It presents locations of wetlands, wetland categories and stream locations. It does not present Cowardin classification.



One environmental function cannot be substituted for another. Maintain all individual functional values in the wetland unit.

Maintain all aggregate functional values in the wetland unit. One environmental function can be substituted for another.

Maintain overall functional value on roaded system. No net loss of aggregate value to region.

Minimize adverse impacts to functional values.

Wetland generally restricted due to land ownership or management status.

Probable wetland.

Tidelands with dispersed eelgrass beds are also present in the project area. Eelgrass is a marine underwater plant that roots in the sediments of our bays and estuaries, forming meadows in coastal waters. Eelgrass is designated as Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation and Management Act.

The three-dimensional habitat of a healthy eelgrass meadow supports part of the life cycle of herring, mussels, scallops, and crabs. Eelgrass also contributes to the productivity of coastal waters by stabilizing bottom sediments, filtering nutrients and particles out of the water, and by providing sheltered nursery areas for young fish and

shellfish. Dead eelgrass decomposes into a detrital "chowder" that is an essential part of the marine food web.

There would be some additional impact to local wetlands by activities associated with proposed short-term improvements in the Auke Bay area. The long term plan phase 1 route east of Auke Lake would impact meadow wetlands and wetlands adjacent to the small drainage that runs along the base of the hill. The small drainage and associated wetlands along the base of the hill are considered to be high value. Wetlands in this area have been impacted by residential development and road construction. This route may also impact some forested wetlands. The following photo characterizes this meadow wetland area.



Figure 2-Wildmeadow wetlands

The proposed intersection of the new bypass and Back Loop Road would impact the wet meadow-beaver marsh area located just north of the Back Loop Road. This area appears to be a high value wetland. Following is a photo of this area.



Figure 3 - Hanna Creek wetland

The long term plan phase 2 route would cross several muskeg and forested wetland areas. Forested wetlands impacted by long term plans do not appear to be unique. It is estimated that about a total of ten acres of various wetlands types will be impacted by the preliminary preferred alternative.

Water Bodies in Project Area

Auke Bay is a large open bay 14 miles north of downtown Juneau supporting a wide variety of public, private, commercial and institutional developments. Auke Bay is a site of heavy recreational and commercial boating use, containing one public and two private marinas and a public boat launch ramp. The bay is also the source of salt water for research conducted at the National Marine Fisheries Service (NMFS) laboratory and

UAS research facilities. The bay has high scenic values and provides habitat for aquatic life.

Auke Lake is state-owned. It is about one mile long and $\frac{3}{4}$ mile wide with a surface area of 175 acres. Auke Lake has high values for habitat and recreation because of the adjoining UAS facilities, five anadromous fish tributaries, and public use. The lake is used for fisheries research, sport fishing (including winter ice-fishing), supply water for the hatchery at the mouth of Auke Creek, boating, water skiing, jet skiing, floatplanes, and cross country skiing. The Chapel by the Lake and the UAS campus located on adjacent uplands are tourist destinations partially because of the views of Auke Lake and the Mendenhall Glacier. CBJ has an undeveloped small boat launch and parking area on the south end of the lake off the Glacier Highway. CBJ has established a trailhead at the south end of the lake and a trail along the east shore. Private homes are located along the north and northwest shores. Auke Lake is also an important area for nesting waterfowl and provides resting area for migrating birds.

Auke Creek drains an area of around $3\frac{1}{2}$ square miles. The streambed substrate is mostly gravel with some bedrock. A weir has been operated at Auke Creek since 1963. The weir is located above the mean tide line about 400 yards downstream from the outlet of Auke Lake. The weir is cooperatively funded and operated by the State of Alaska, Department of Fish and Game, Division of Sport Fish, the National Marine Fisheries Service and the University of Alaska, Fairbanks. The weir is a two-way permanent structure that has the ability to capture all fish returning to and exiting Auke Lake. The system is unique as a research site, in that a very long history of fishery data is available.

Bay Creek is located approximately 11 miles northwest of Juneau and is crossed by Glacier Highway immediately above tidewater. It enters the northernmost end of Auke Bay directly east of the Auke Bay Treatment Plant.

Waydelich Creek flows in a southerly direction for approximately two miles before entering saltwater on the west side of Auke Bay. The stream drains a watershed of approximately one square mile.

Auke Nu Creek drains a watershed of about 1 square mile and flows in a southeasterly direction. A tributary to the southwest joins it before entering a wooden box culvert under Glacier Highway.

Anadromous and Resident Fish Streams

Information in this section is from the State of Alaska Department of Fish and Game's 1993 Juneau Fish Habitat Assessment and field visits.

Auke Lake and tributaries

Anadromous Stream Catalog Number: 111-50-10420. Auke Lake has runs of coho, pink, chum and sockeye salmon, Dolly Varden, and cutthroat and rainbow trout. The lake provides both rearing habitat and upwelling areas which are used by lake-spawning salmon.

Auke Creek flows about 0.3 miles from Auke Lake to salt water in Auke Bay. It provides good rearing and spawning habitat and access for fish destined for Auke Lake and upper tributaries. Fish migrating into and out of Auke Lake are counted as they are passed through the Auke Creek weir.

UAJ (111-50-10420-2012) and MB Creeks(111-50-10420-2015) are small tributaries that enter the northwest corner of Auke Lake. These small streams occasionally dry up during hot weather but provide seasonally important rearing areas for small salmonids. MB Creek also provides some spawning habitat.

Lake Creek (111-50-10420-20210) is the largest tributary feeding Auke Lake and is a major spawning area for Auke Lake stocks. Most salmon spawning is known to occur in the lower 2000 feet of the stream. Dolly Varden and cutthroat trout use habitat further upstream. The stream provides rearing habitat in pools and has excellent woody cover. The streams rearing potential, however, is compromised by it's steep gradient in the upper reaches. A falls located about one mile upstream from the stream mouth presents a barrier to upstream fish movement. The photo below is of Lake Creek.



Figure 4 - Lake Creek

Lake Two Creek (111-50-10420-2008) also known as Little Lake Creek drains an area of about one square mile directly east of the Lake Creek watershed. This small stream is about one mile long and with a low gradient provides good spawning and rearing habitat throughout its length. Salmon are known to spawn in the lower half of the stream and trout and char are known to also utilize the upper reaches. The photo below is of Lake Two Creek just off of Back Loop Road.



Figure 5 - Lake Two Creek

Hanna Creek (111-50-10420-2006) is a small drainage that enters the northeast corner of Auke Lake. It is believed that sedimentation from construction of Back Loop Road degraded fish habitat in lower Hanna Creek. This small stream drains a large wetland-beaver marsh area located on the north side of Back Loop Road which provides good rearing habitat for juvenile salmonids. See photo in wetlands section.



Figure 6 – Start of Auke Creek



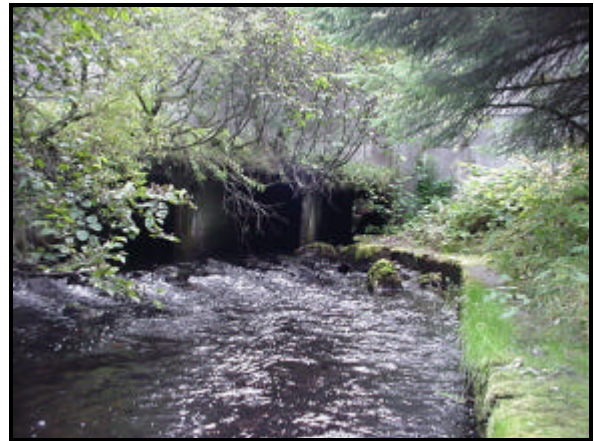
Figure 7 – Auke Creek leaves Auke Lake

Auke Creek

Auke Creek flows under Glacier Highway through three, 6 foot by 6 foot, concrete box culverts 36 feet in length. Gravel, cobbles and riffle boards are present on the bottom of the westernmost box culvert. During the field visits cracks and patched cracks were visible in the concrete.



Figure 8 – Auke Creek entering structure under Glacier Highway



9 – Auke Creek exiting structure under Glacier Highway

Bay Creek

Anadromous Stream Catalog Number: 111-40-10390

Bay Creek supports both pink and coho salmon and Dolly Varden. The creek provides spawning habitat for pink salmon in the lower 50 yards of the stream and the intertidal area. The stream has numerous pools, overhanging banks, logs and dense overhead cover which provide excellent habitat for spawning and rearing for coho salmon and Dolly Varden. There is an educational trail system at Bay Creek which is connected to the Auke Bay School.

There is currently no development in this tideland area. On the adjacent uplands to the west of Bay Creek are an 18-unit condominium and the Auke Bay Waste Water Treatment Plant. On adjacent tidelands to the east is undeveloped fill on state-leased tidelands. The 1993 Juneau Fish Habitat Assessment recommended an opportunity to improve spawning habitat below Glacier Highway. The enhancement could consist of excavating a pool at the downstream end of the existing highway culvert along with the importation and stabilization of high quality spawning gravel downstream of the pool for approximately 100 feet.

The University of Alaska has agreed to make some improvements to fish passage through the Bay Creek culvert. The work is being done as mitigation for wetlands fills at the proposed UAS/National Guard Joint Use Facility, and is scheduled to be completed this summer (2003). The University will build some step pools below the culvert to help fish get access to the culvert. The culvert will be retrofitted with some baffles to break up flow and retain sediment. The habitat in the reach directly above the culvert is also at a very high gradient, and could benefit from some small step pools to help fish gain access to lower gradient areas farther upstream.



Figure 10 - Bay Creek Draining into Auke Bay

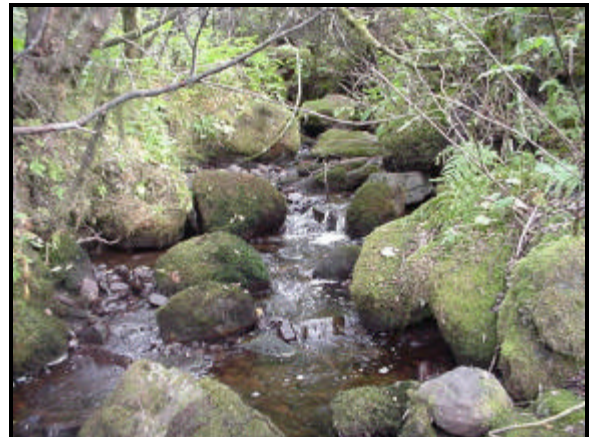


Figure 11 - Bay Creek just before entering culvert under Glacier Highway

Bay Creek flows under Glacier Highway through a 5-foot diameter corrugated metal pipe. There was no gravel in the bottom of the pipe. The culvert has minor amount of rust on the surface. A 2-foot culvert drains directly from an inlet on Glacier Highway into the Bay Creek Culvert. Please refer to Figures 8 and 9 below.



Figure 12 - Bay Creek entering culvert under Glacier Highway



Figure 13 - Glacier Highway Inlet



Figure 14 - Bay Creek exiting culvert under Glacier Highway



Figure 15 - Bay Creek culvert with algae growth on bottom of pipe

Waydelich Creek

Anadromous Stream Catalog Number: 111-40-10370

Waydelich Creek runs in a southerly direction for about two miles before entering salt water on the west side of Auke Bay. The creek supports pink and chum salmon and Dolly Varden char. It provides spawning habitat for both species of salmon. The falls located just downstream from Glacier Highway is likely a barrier to upstream migration. The perched culvert just upstream from the falls would also impede upstream fish migration.

In 1983 a water reservoir for a streamside condominium complex was constructed near the site of a barrier falls. As mitigation for constructing the dams, the developers were required to enhance the spawning area downstream from the dam. The enhanced area has been scoured by heavy stream flows. The Juneau Fish Habitat Assessment recommends re-establishing the spawning area by replacing the spawning substrate that has been washed out.



Figure 16 – Waydelich Creek before entering culvert under Glacier Highway

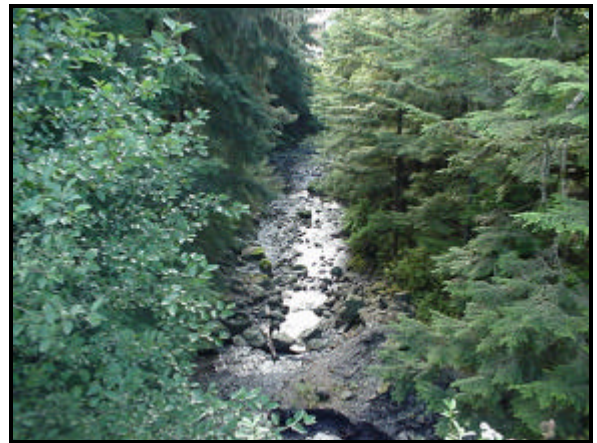


Figure 17 – Waydelich Creek after exiting culvert under Glacier Highway as seen from Glacier Highway

Waydelich Creek flows under Glacier Highway in a 10-foot diameter corrugated metal pipe culvert. There was no gravel observed in the bottom of the culvert. The inside of the pipe has a minimal amount of surface rust. The culvert is perched. Please refer to Figure 19 below.



Figure 18 – Waydelich Creek entering culvert under Glacier Highway



Figure 19 – Waydelich Creek exiting culvert under Glacier Highway

Auke Nu Creek

Anadromous Stream Catalog Number: 111-40-10350

This stream has provides spawning habitat for pink salmon. Only the east fork of the stream is a catalogued fish stream. There is good intertidal spawning area below Glacier Highway.



Figure 20 - Auke Nu Creek before entering culvert under Glacier Highway



Figure 21 - Auke Nu Creek entering culvert under Glacier Highway



**Figure 22 – Auke Nu Creek exiting culvert under
Glacier Highway**



**Figure 23 – Auke Nu Creek exiting culvert under
Glacier Highway**



Figure 24 - W. Auke Nu Creek



Figure 25 - E. Auke Nu Creek

The table below summarizes impacts to the streams discussed above.

<i>Preliminary Preferred Alternative, Impacts to creeks</i>	
Auke Creek	In short term replace culvert
Waydelich Creek	In short term extend existing culvert and install new culvert to accommodate long term plan
Bay Creek	In short term extend existing culvert and install new culvert to accommodate long term plan
Auke Nu Creek	In short term extend existing culvert and install new culvert to accommodate long term plan
Lake Creek	Install new crossing to accommodate long term plan
Lake Two Creek	Install new crossing to accommodate long term plan
Hanna Creek	Install new crossing to accommodate long term plan
Wild Meadow Drainage	Install new crossing to accommodate long term plan

Essential Fish Habitat

Essential Fish Habitat is defined as those waters and substrate necessary to fish managed by the North Pacific Fisheries Management Council (NPFMC) for spawning, breeding, feeding or growth to maturity. The Council has primary responsibility for anadromous fish, commercial fish and its prey.

For the purpose of interpreting the definition of essential fish habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

There are eight anadromous fish streams within the project study area that will be impacted by the preliminary preferred alternative.

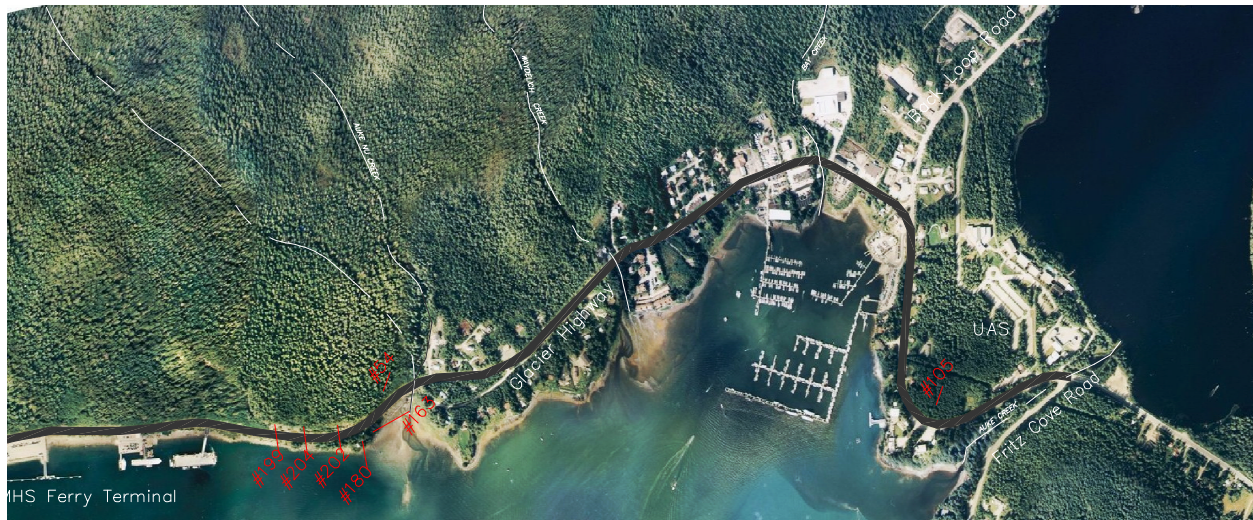
Wildlife Resources

The Alaska Department of Fish and Game, Wildlife Conservation Division could not identify any species of special concern in the immediate project area. Sitka black tailed deer, black and the occasional brown bear, beaver, otter, and a variety of birds are common in the area.

Proposed short-term improvements should not have any impact on local wildlife populations. However, an additional five miles of highway included in long term plans would increase potential for vehicle/wildlife accidents. The ridge just east of Auke Lake is used as a travel corridor by deer and bear. The bypass proposed in the long term phase 1 plans would cross this ridge.

Bald Eagles

A location map of eagle trees along the project corridor follows this paragraph. The locations are approximate. There are four eagle trees (nos. 105, 163, 202, and 204) located along Glacier Highway. According to Mike Jacobsen of the U.S. Fish and Wildlife Service, tree nos. 54, 180, and 199 are eagle trees with eagles no longer present.



Eagle nest trees are located near the mouth of Auke Creek and near Auke Nu Creek at the west end of the project area. Eagle nest trees are not necessarily used every year. However, given the number of nest trees in the project area, stipulations during nesting periods can be expected.

Alaska Coastal Management Program

The project study area is in the jurisdiction of the Juneau Coastal Management Plan. These areas are also categorized as Auke Bay Areas Meriting Special Attention. A consistency review will need to be conducted for the preliminary preferred alternative.

Hazardous Waste

There are no documented or suspected areas of hazardous waste with the project study area.

Air Quality Conformity

The project is not within a non-attainment area. The project area is in an area of good circulation. Also the roads within the project area are paved.

Floodplains

There are no floodways delineated in the study area according to the Flood Insurance Study written by FEMA in 1990.

Noise

No noise impacts are anticipated, as this preliminary preferred alternative will not create a new traffic demand. However, noise impacts will need to be addressed. The locations of sensitive noise receivers (schools, parks, libraries) are presented on the Social and Economic map.

Water Quality

There are no impaired water bodies within the project limits. Drinking water is supplied by the city and not obtained within the project limits. Other than the instance of road runoff draining directly off of Glacier Highway and into Bay and Creek, the normal amount of non-point pollution from street traffic is expected in the area.

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